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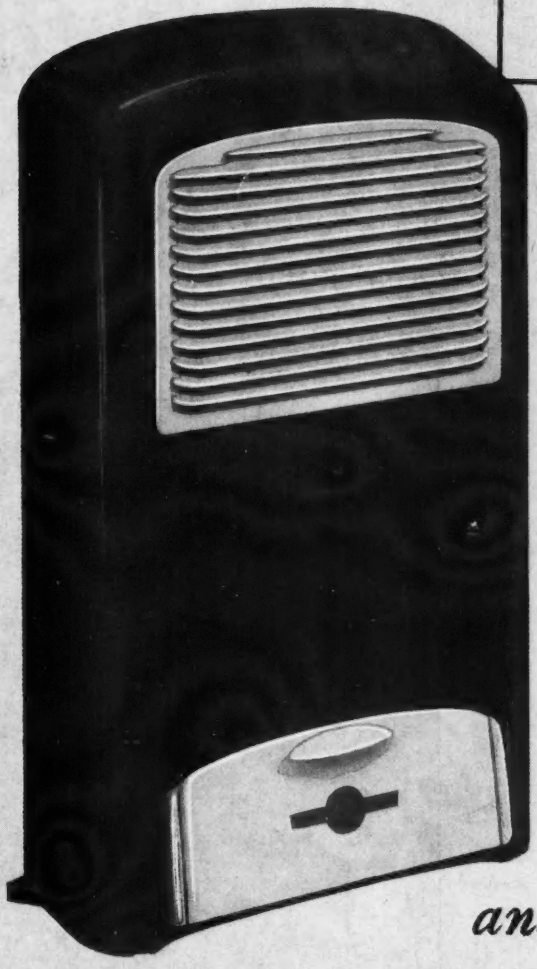

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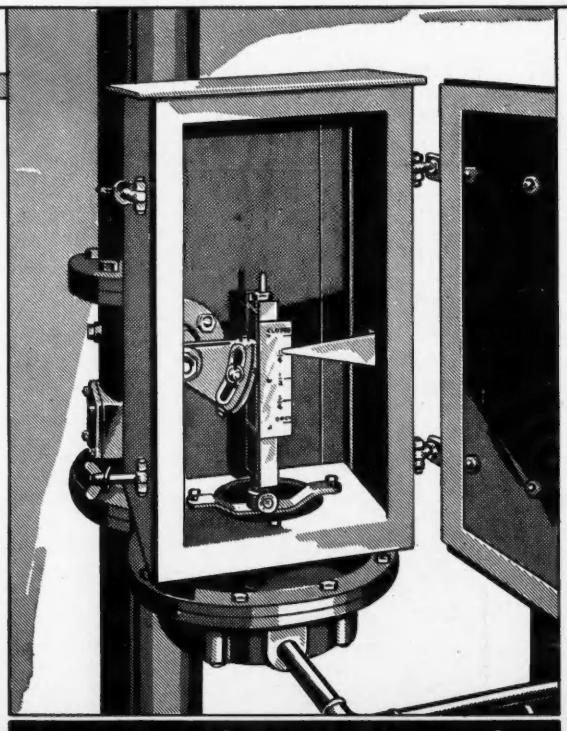

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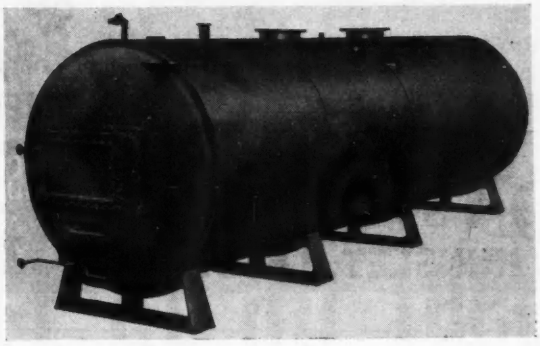

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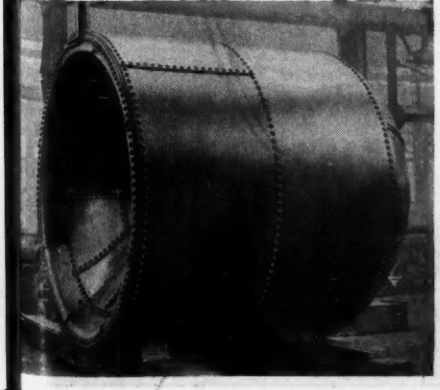

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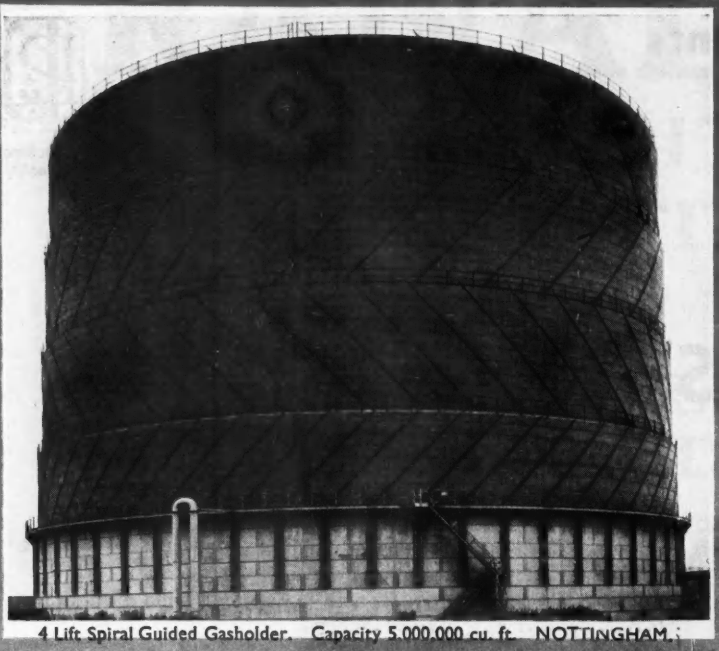

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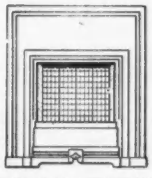

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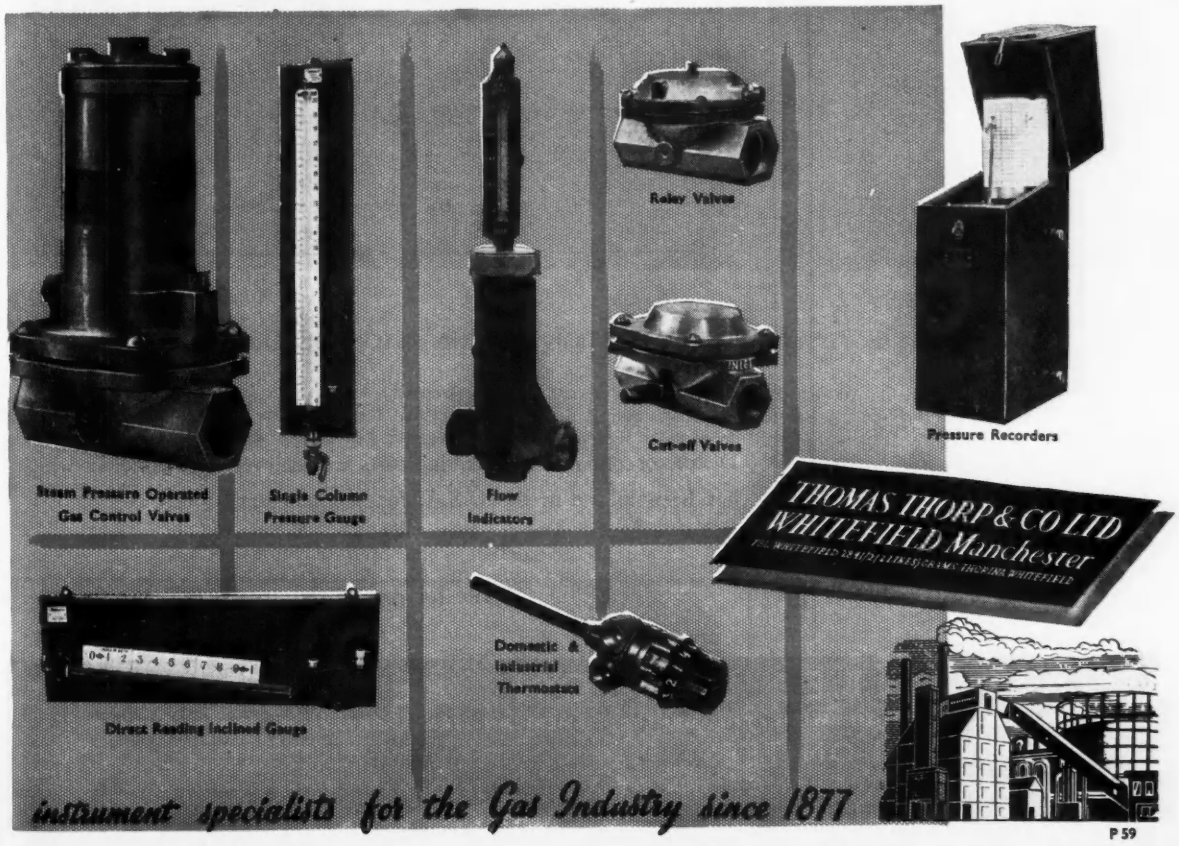
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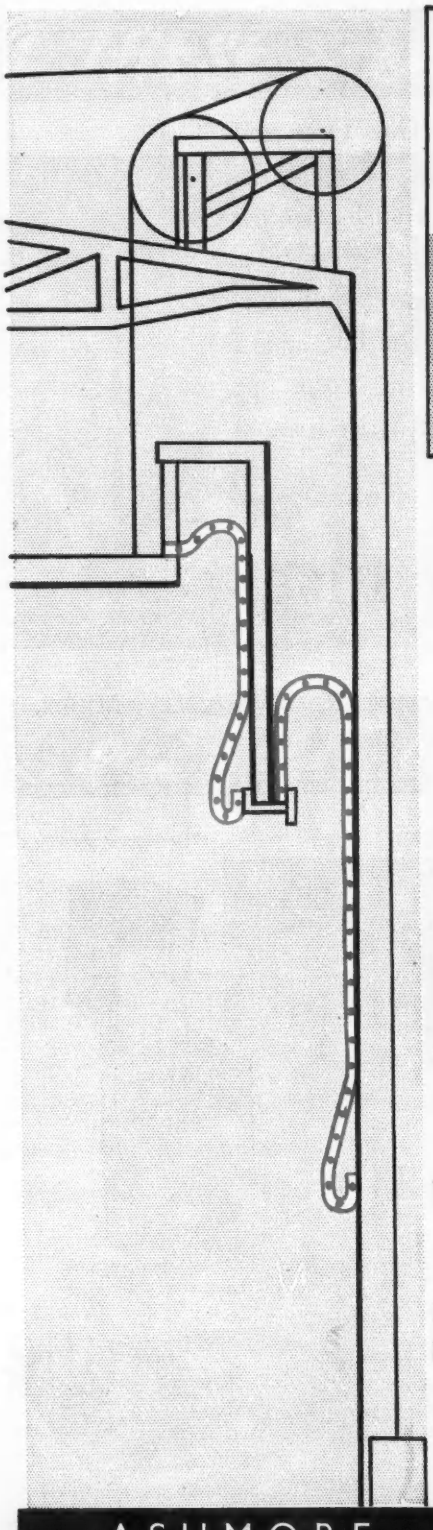

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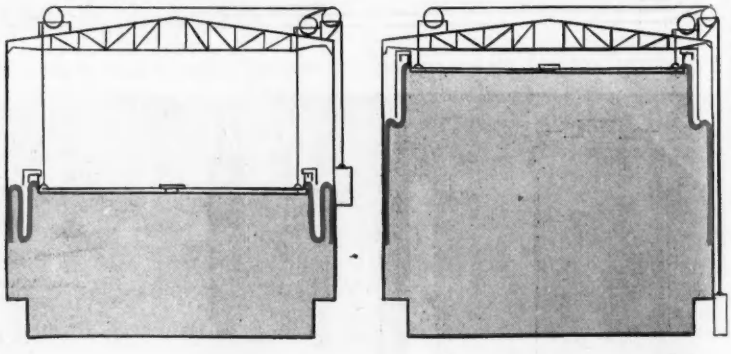

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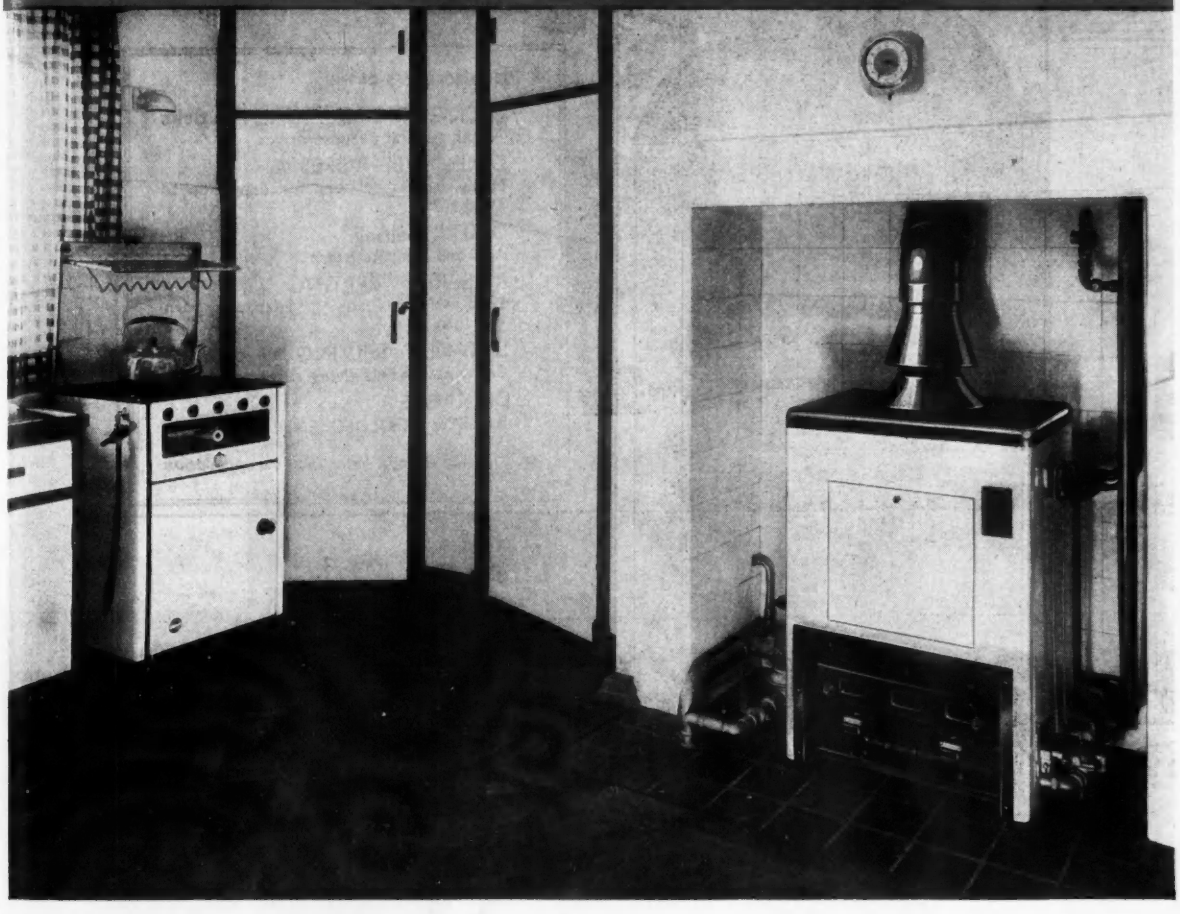

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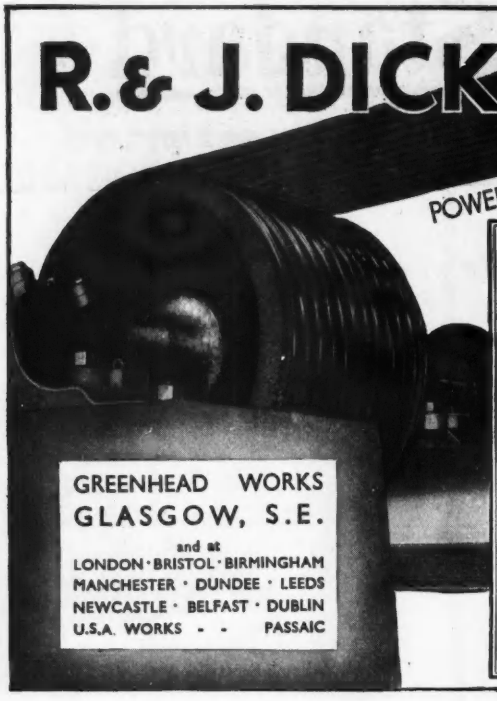

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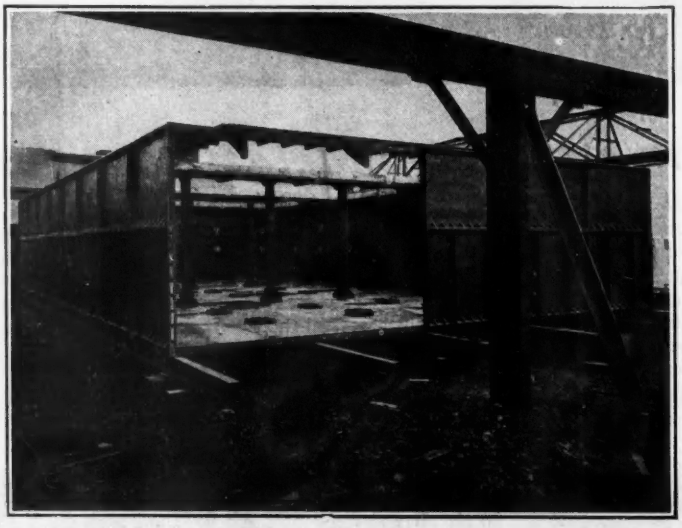

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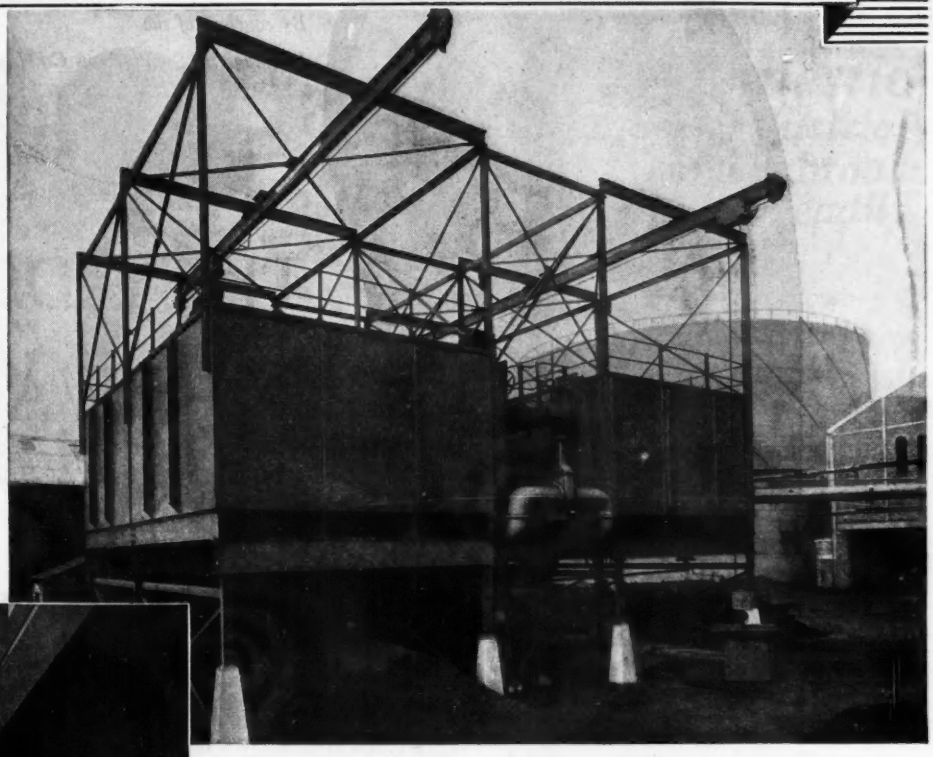

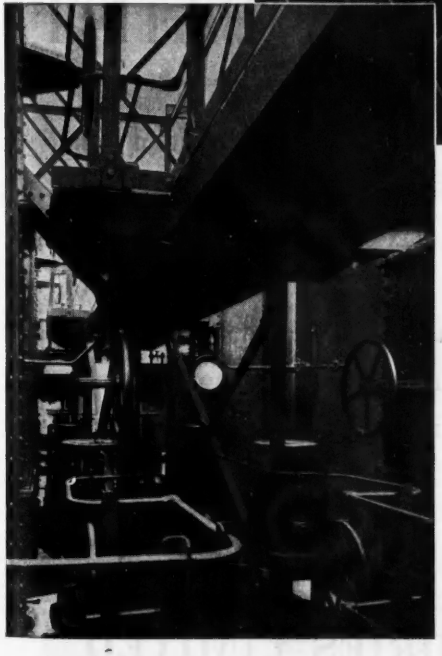

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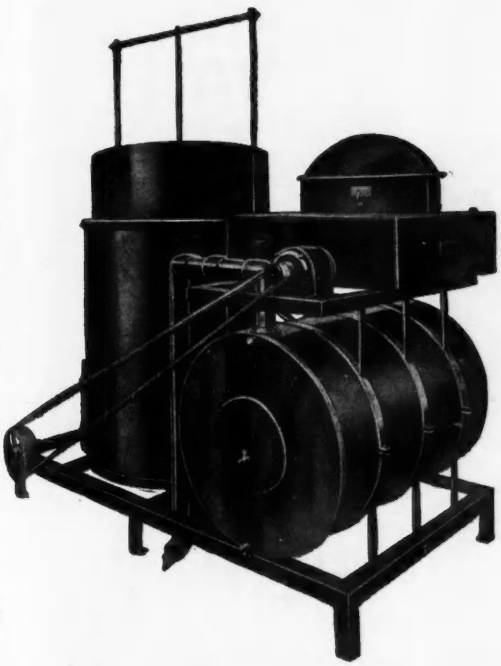

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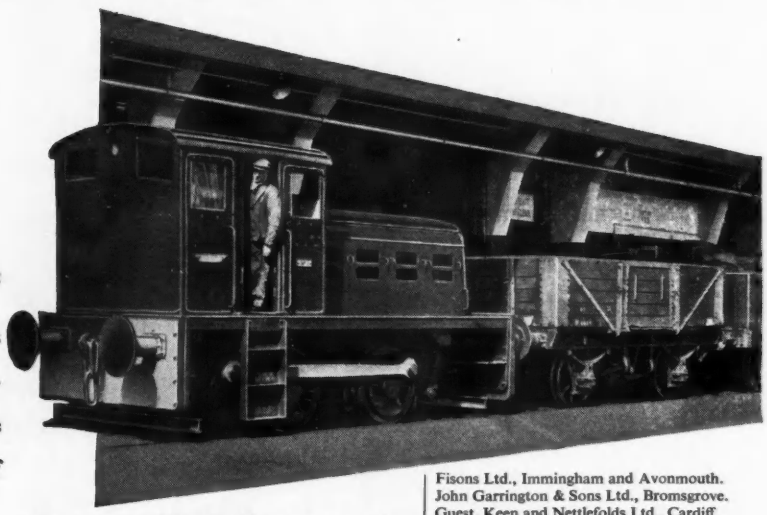

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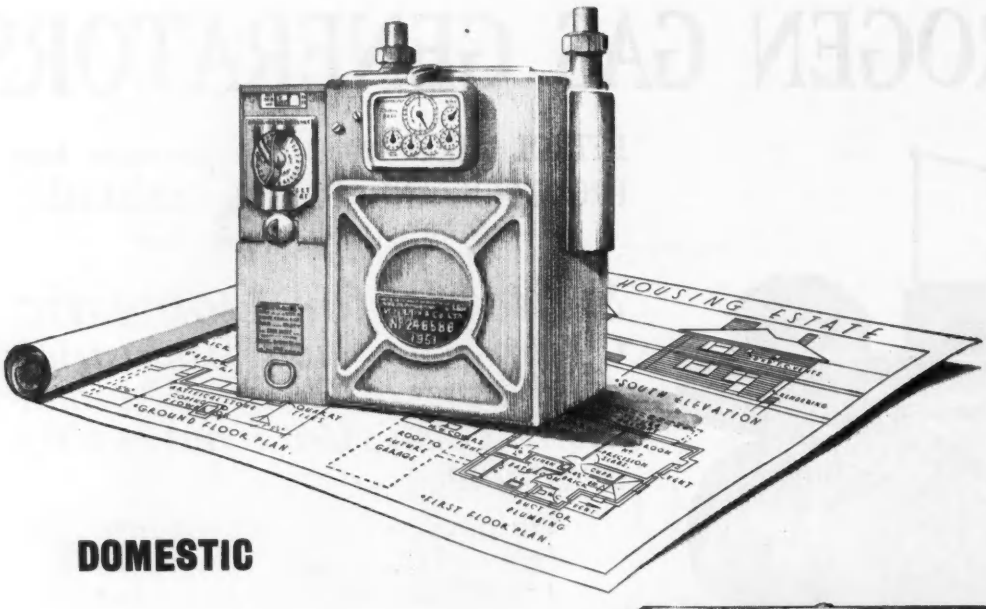

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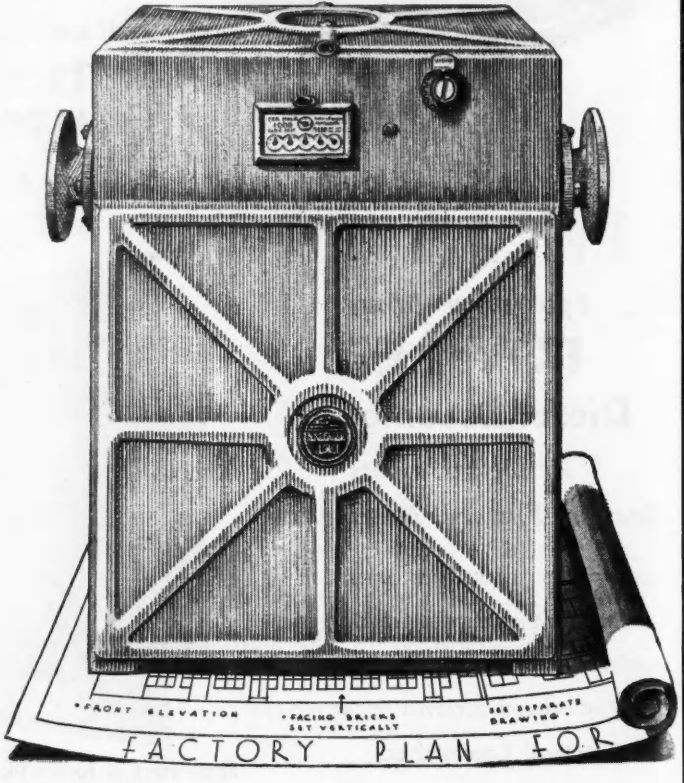

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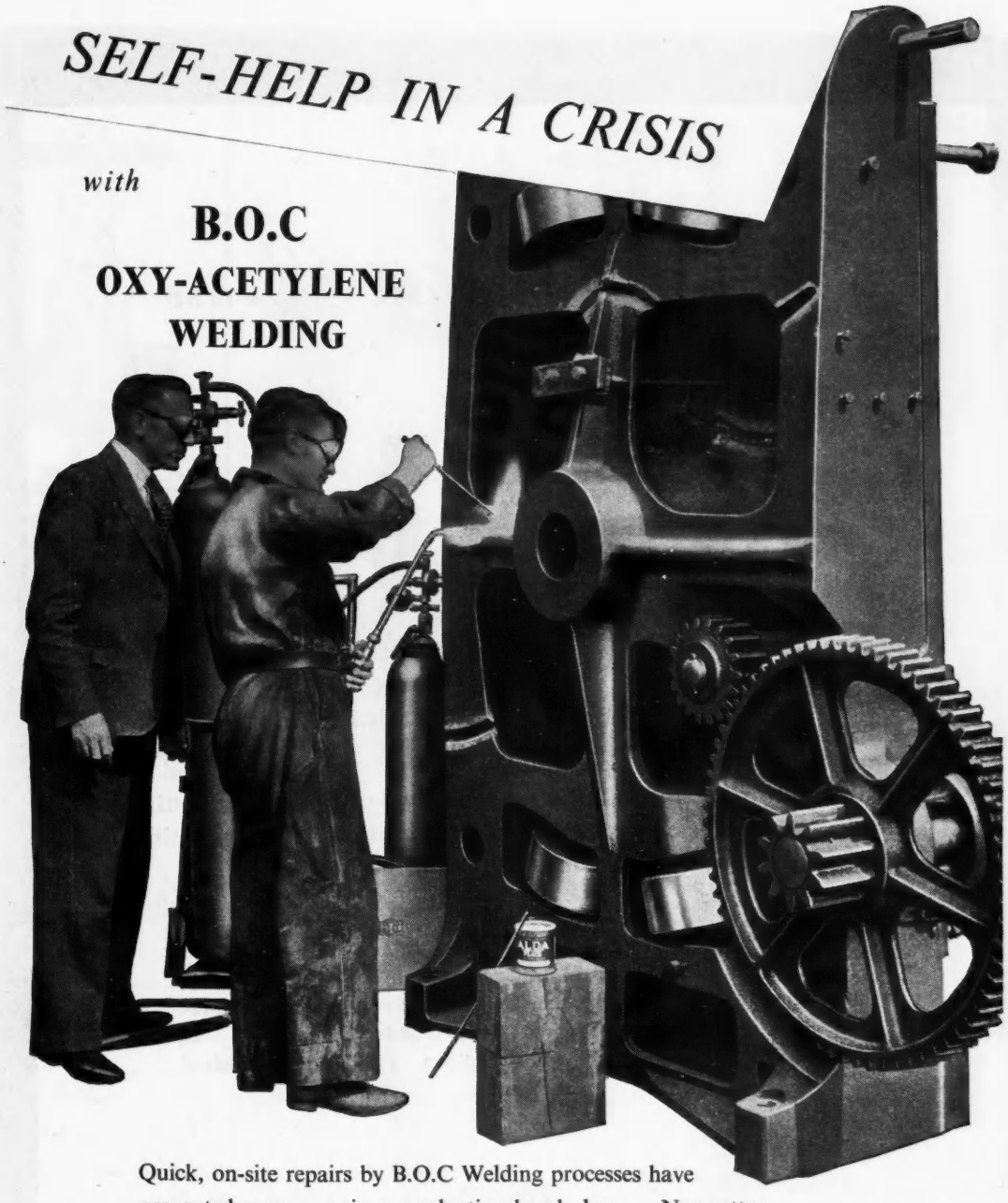

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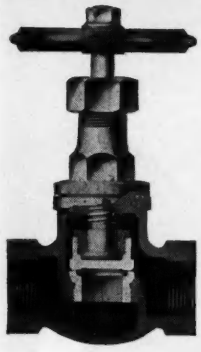

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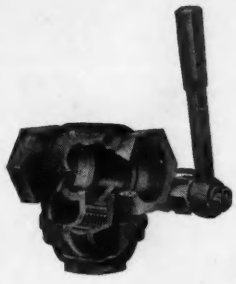

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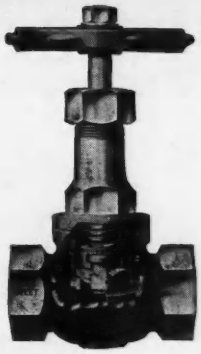

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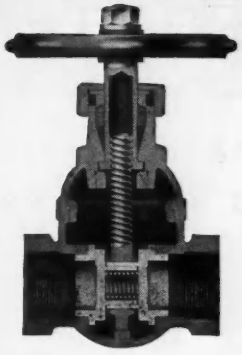

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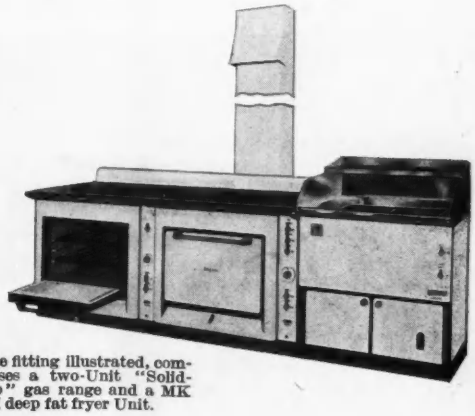

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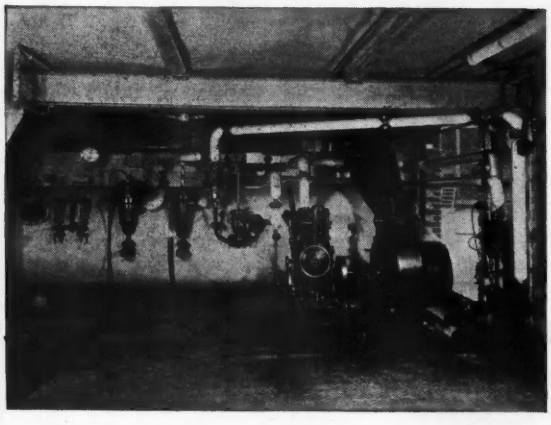

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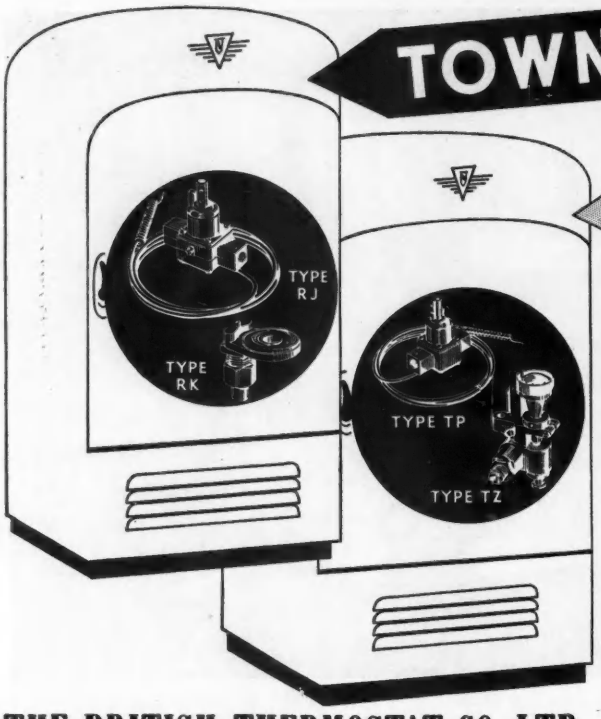

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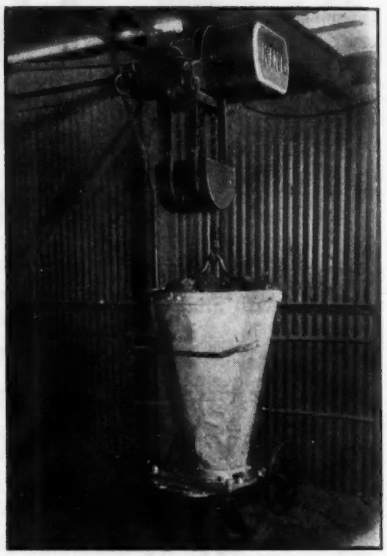

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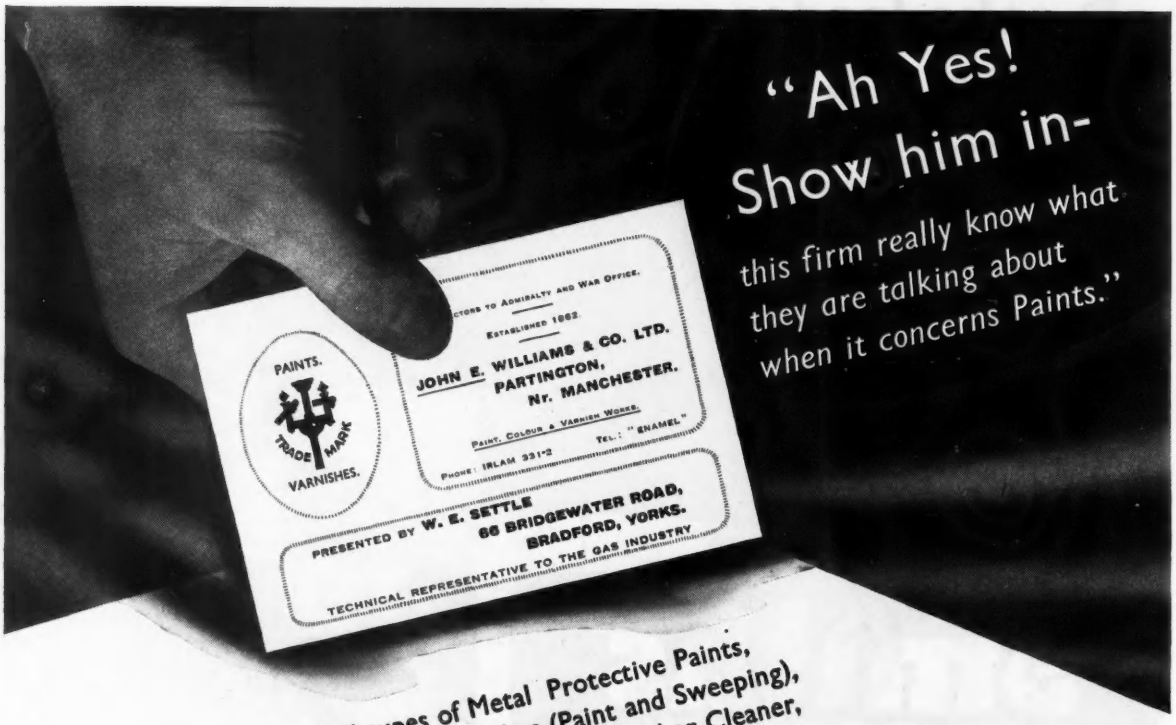

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INDEX TO 'JOURNAL' ADVERTISERS

PAGE

A

A.C.E. Machinery, Ltd. ... ...
Abbott, Birks & Co., Ltd. ... ...
Accurate Recording Instrument Co. ... ...
Acme Wringers, Ltd. ... ...
Aerogen Co., Ltd. 647
Alder & Mackay, Ltd. 688
Allan Taylor (Engineers) Ltd. ... ...
Armco, Ltd. ... ...
Armco, Ltd., (Bundy Tubing Division) ... ...
Ascot Gas Water Heaters, Ltd. ... ...
Ascot Gas Water Heaters, Ltd. (F.A. Neat) ...
Ashmore, Benson, Pease & Co. 642
Aspinall's (Paints), Ltd. ... ...
Associated Lead Manufacturers, Ltd. ... ...
Associated Lead Manufacturers, Ltd. (Rustodian) ...
Automatic Telephone & Electric Co., Ltd. ...
Automotive Products, Ltd.... ... ...
Averill, C. R., Ltd. ... ...

B

Bailey, Sir W. H., & Co., Ltd. ... ...
Bale & Church, Ltd. S3
Balfour, Henry, & Co., Ltd. ... ...
Begwaco Meters, Ltd. ... ...
Bell's Asbestos & Engineering, Ltd. 661
Benham & Sons, Ltd. 653
Blakeley, Firth, Sons & Co., Ltd.... ... ...
Booth, John & Sons (Bolton), Ltd. ... ...
Boydell, E., & Co., Ltd. ... ...
Bratt Colbran, Ltd. 641
Bray, George, & Co., Ltd. ... ...
Bray, W. E., & Co., Ltd. ... ...
Bridges, S. N. & Co., Ltd. ... ...
Bright, Son & Co. (Clerkenwell), Ltd. S4
Bristol's Instrument Co., Ltd. ... ...
British Flint & Cerium Manufacturers, Ltd. ...
British, Foreign & Colonial Automatic Light Controlling Co., Ltd. ... ...
British Furnaces, Ltd. ... ...
British Gas Purifying Materials Co. S4
British Industries Fair ... ...
British Iron & Steel Federation ... ...
British Oxygen Co., Ltd. 651
British Paints, Ltd. ... ...
British Thermostat Co., Ltd. 658
British Thomson Houston, Ltd. ... ...
British Tyre and Rubber Co., Ltd. 657
British Vacuum Cleaner & Engineering Co., Ltd. ...
Broadbent, Thomas, & Sons, Ltd. ... ...
Brockhouse Heater Co., Ltd. ... ...
Broom & Wade, Ltd. ... ...
Brotherhood, Peter, Ltd. ... ...
Brown, J., & Co., Ltd. S2
Bugden, Thos., & Co. ... ...

C

Cambridge Instrument Co., Ltd. ... ...
Cannon Iron Foundries, Ltd. ... ...
Carron Co. ... ...
Cementation Co., Ltd. ... ...
Central Manufacturing & Trading Co. (Dudley) Ltd. S2
Chemical Engineering & Wilton's Patent Furnace Co., Ltd. ... ...
Chemical & Insulating Co., Ltd. ... ...
Cinema-Television, Ltd. ... ...
Clapham Bros., Ltd. ... ...
Clayton, Son & Co., Ltd. 638
Clifford Engineering Co., Ltd. S2
Cochran & Co., Annan, Ltd. ... ...
Cohen, George, Sons & Co., Ltd. ... ...
Collins, Thomas, & Co., Ltd. ... ...
Concrete Proofing Co., Ltd. ... ...
Consolidated Pneumatic Tool Co., Ltd. ... ...
Coventry Chromium Plating Co. Ltd. ... Cover II
Cowper Penfold & Co., Ltd. ... ...
Cox & Danks, Ltd.... ... ...
Crane, Ltd. ... ...
Crone & Taylor, Ltd. ... ...
Crosby & Co., Ltd. ... ...
Crosslands (Rugeley) Ltd. ... ...
Crossley Bros. ... ...
Curtis, A. L. & Co. S2
Cutler, Samuel, & Sons, Ltd. ... ...

D

Davey, Paxman & Co., Ltd. ... ...
De la Rue, Thomas, & Co., Ltd. (Potterton Gas Division) ... ...
Demolition & Construction Co. Ltd. ... ...
Dempster, R. & J., Ltd. 637
Dempster, Robert, & Sons, Ltd. 678
Derbyshire Silica Firebrick Co., Ltd. ... ...
Diaphragm & General Leather Co., Ltd. ... ...
Dick, R. & J., Ltd. 644
Donkin (The Bryan) Co., Ltd. ... ... Cover II
Douglas, Robert M., (Contractors), Ltd. ... ...
Douglas, William, & Sons, Ltd. ... ...
Drakes, Ltd. ... ...
Drew, H. R., Ltd. ... ...
Dunlop & Ranken, Ltd. ... ...

E

E.B. Refractory Cement Co., Ltd. S2
Edgar, William, & Son, Ltd. 652
Electroflo Meters Co., Ltd. ... ...
Electrolux, Ltd. ... ...
Elliott Bros. (London), Ltd. ... ...
English Electric Co., Ltd. ... ...
Ether, Ltd. ... ...
Evershed & Vignoles, Ltd.... ... ...
Ewart Chainbelt Co., Ltd. ... ...
Ewart & Sons, Ltd.... ... ...
Expanded Metal Co., Ltd.... ... ...

PAGE

F

Falk Stadelmann & Co., Ltd. ... ...
Fibreglass, Ltd. 640
Filtrators, Ltd. ... ...
Flavel, S., & Co., Ltd. ... ...
Fluxite, Ltd. ... ...
Four Oaks Spraying Machine Co., Ltd. ... ...
Fowler, John & Co., (Leeds) Ltd.... 647
Franki Compressed Pile Co., Ltd. ... ...
Fraser & Chalmers, Engineering Works ... ...
Fry's Metal Foundries, Ltd. 646
Fyffe & Co., Ltd. ... ...

G

Gas Chambers & Coke Ovens, Ltd. ... ...
Gas Purification & Chemical, Ltd. S3
General Descaling Co., Ltd. ... ...
General Electric Co. Ltd., ...
General Gas Appliances, Ltd. ... ...
Gibbons Bros., Ltd. 655
Gibbons (Dudley), Ltd. ... ...
Glover, George, & Co., Ltd. 638
Glover, Thomas, & Co., Ltd. 666
Goodall Clayton & Co., Ltd. S6
Goodyear Mechanical Goods ... ...
Grant, David, & Co., Ltd.... ... ...
Graphite Products, Ltd. ... ...
Green & Boulding, Ltd. S4

H

Hamilton, A. H., & Co., Ltd. ... ...
Hardman & Holden, Ltd. ... ...
Harris & Pearson, Ltd. S6
Harrisons (London), Ltd. S4
Harvey, G. A., & Co. (London), Ltd. ... ...
Head Wrightson Processes, Ltd. ... ...
Heaths (Eccles), Ltd. 658
Hayward Tyler, & Co., Ltd. ... ...
Hewitt Construction Co., Ltd. ... ...
Hickson's Timber Impregnation Co. (G.B.), Ltd. ...
Hilmor, Ltd.... ... ...
Holden & Brooke, Ltd. ... ...
Holmes, W. C., & Co., Ltd. S5
Honeywell-Brown, Ltd. ... ...
Hopkinsons, Ltd. 653
Horseley Bridge & Thomas Piggott, Ltd. ...
Horstmann Gear Co., Ltd.... ... ...
Howden, James, & Co., Ltd. ... ...
Hughes, F. A. & Co., Ltd. ... ...
Humphreys & Glasgow, Ltd. 664

I

Ideal Boilers & Radiators, Ltd. 643
I.C.I. Ltd. (Metals Division) ... ...
Incandescent Heat Co., Ltd. ... ...
Ingham, John, & Sons, Ltd. ... ...
International Coin Counting Machine Co., Ltd. ...
International Combustion, Ltd. 639

J

Jeavons, E. E., & Co., Ltd. ... ...
Jeavons Engineering Co. ... ...
Jenkins, W. J., & Co., Ltd. ... ...
Johnson, C. H. (Machinery) Ltd. ... ...

K

Keay, E. C. & J., Ltd 644
Keith Blackman, Ltd S6
Kerr, John & Co., (M/C) Ltd. ... ...
King, Geo. W, Ltd.... 660
King, Walter, Ltd. 688, S1, S3, S4
Kings Patent Agency, Ltd.... ... ...
Kirk & Co. (Tubes), Ltd. ... ...
Kirkham Hulett & Chandler, Ltd. 656
Kleenoff Co.... ... ...
Klinger, Richard, Ltd. ... ...

L

Laidlaw, R., & Son (Edin.), Ltd. ... ...
Lamont, James H., & Co., Ltd. ... ...
Lancashire Dynamo & Crypto, Ltd. ... ...
Lawler, Ayers & Co., Ltd.... ... ...
Le Bas Tube Co., Ltd. ... ...
Leeds X.L. Fire Cement Co. ... ...
Lionweld, Ltd. 654
Lind, Peter, Ltd. ... ...

M

Macpherson, Donald, & Co., Ltd. ... ...
Magnetic Valve Co., Ltd. ... ...
Main, R. & A., Ltd. ... ...
Mavor & Coulson, Ltd. ... ...
Meltham Silica Fire Brick Co., Ltd. ... ...
Messenger & Sons, Ltd. ... ...
Meters, Ltd.... ... ...
Metropolitan Leather Co., Ltd. ... ...
Milnes Meters, Ltd. ... ...
Mitchell, H., & Co.... 658
Monk, A., & Co., Ltd. ... ...
Morris Commercial Cars, Ltd. 649

N

National Benzole Co., Ltd. ... ...
National Enamels, Ltd. ... ...
Newton Chambers & Co., Ltd. ... ...
Nordac, Ltd. ... ...
Nu-Swift Ltd. S3

O

Orme, Evans & Co., Ltd. ... ...
Oxley Engineering Co., Ltd. ... ...

P

Parkinson & Cowan (Gas Meters), Ltd. 666
Parkinson Stove Co., Ltd. ... ...
Pass, E. & Co., Ltd. ... ...

PAGE

Peckett & Sons, Ltd. ... ...
Peebles & Co., Ltd.... ... ...
Pegson, Ltd. ... ...
Perl Controls, Ltd. ... ...
Pinchin, W. & Co., Ltd. 650
Power Gas Corporation, Ltd. 642
Powers-Samas Accounting Machines (Sales), Ltd. ...
Press, William, & Son, Ltd. ... ...
Pulsometer Engineering Co., Ltd.... ... ...

R

Radiant Heating, Ltd. ... ... Cover I
Radiation, Ltd. 676, 677
Rawlplug Co., Ltd. ... ...
Reavell & Co., Ltd.... ... ... S2
Riley, A. J., & Son, Ltd. ... ...
Roberts, R. E. & Sons, Ltd. ... ...
Royles, Ltd. ... ...
Rozalex, Ltd. ... ...
Russell, R., & Sons, Ltd. ... ...

S

Salter, T. E., Ltd. ... ...
Saunders Valve Co. Ltd. ... ...
Scottish Non-Ferrous Tube Industries, Ltd. ... 650
Shannon Ltd. ... ...
Shimwell & Co., Ltd. ... ...
Siebe Gorman & Co., Ltd. ... ...
Sigma Instrument Co., Ltd. ... ...
Simon-Carves, Ltd.... ... ...
Simon, Richard, & Sons, Ltd. ... ...
Sisson, W., & Co., Ltd. ... ...
Slingsby, W., & Co., Ltd. S2
Smith Meters, Ltd. ... ...
Smith, Thos. & Sons, (Rodley), Ltd. 659
Spencer Bonecourt, Ltd. 654
Sperryn & Co. Ltd.... ... ...
Standard Furnace & Setting Co., Ltd. ... ...
Stanton Ironwork Co., Ltd. 656
Staveley Iron & Chemical Co., Ltd. ... ...
Stein, John G., & Co., Ltd. ... ...
Stelcon (Industrial Floors) Ltd. 665
Stewart & Gray, Ltd. ... ...
Stewarts & Lloyds, Ltd. ... ...
Stone, J. B., & Co., Ltd. ... ...
Stoves, Ltd. ... ...
Strachan & Henshaw, Ltd. ... ...
Stringer Bros. ... ...
Sugg, William, & Co., Ltd. ... ...
Summerson, Thos. & Sons, Ltd. 687
Sutcliffe Speakman & Co., Ltd. ... ...
Sutherland, A. G., Ltd. ... ...

T

Tarslag, Ltd. ... ...
Taylor, F., & Sons, Ltd. ... ...
Thermo Control Installations, Ltd. ... ...
Thomas & Bishop, Ltd. ... ...
Thomas (Richard) & Baldwins, Ltd. ... ...
Thompson, John, Conveyor Co. ... ...
Thorp, Thomas, & Co., Ltd. 641
Tully, Sons & Co., Ltd. ... ...
Turners Asbestos Cement Co., Ltd. ... ...

U

Underpressure Engineering Co., Ltd. S2
United Kingdom Construction & Engineering Co., Ltd. ... ...

V

Vale, Thomas, & Sons, Ltd. ... ...
Vanda Meters, Ltd.... ... ...
Visco Engineering Co., Ltd. ... ...
Vulcan Stove Co., Ltd. ... ...

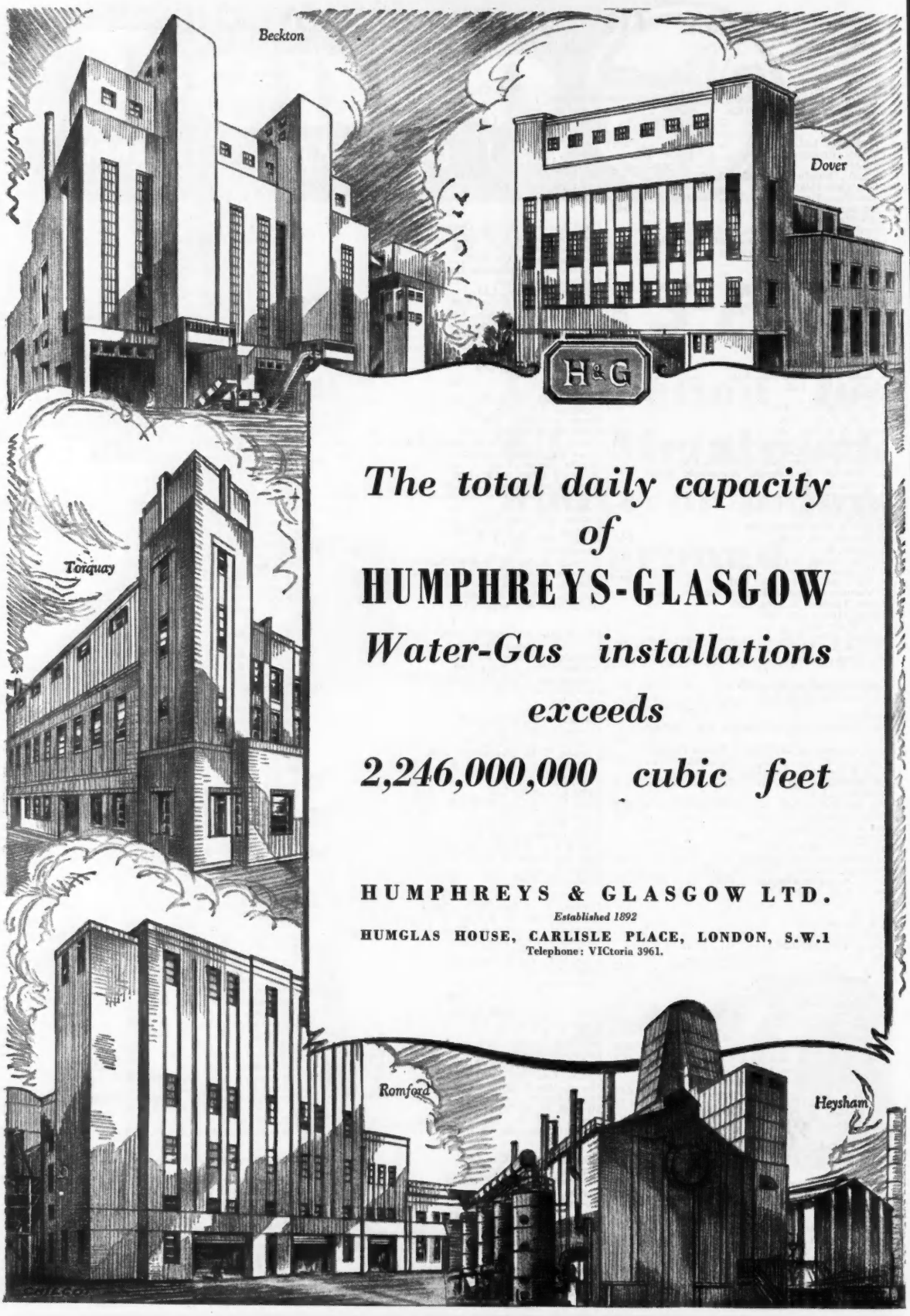
W

W.D. (Sheeters), Ltd. ... ...
Wakefield, C. C., & Co., Ltd. ... ...
Wakelin, F. H., Ltd. ... ...
Walker, C. & W., Ltd. ... ...
Walker, Crosweller & Co., Ltd. ... ...
Waller, George, & Son, Ltd. ... ...
Ward, Thos. W., Ltd. ... ...
Wellington Tube Works, Ltd. ... ... Cover IV
Wellman Smith Owen Engineering Corpn., Ltd. ... ...
Wessex Industries (Poole) Ltd. ... ...
West's Gas Improvement Co., Ltd. ... ... Cover III
West Hunwick Silica & Firebrick Co., Ltd. ... ...
West's Piling & Construction Co., ...
Westwood & Wrights, Ltd. ... ...
Whessoe, Ltd. 645
Whitehouse, Wm., & Co., Ltd. ... ...
Wilkes, A. H., & Co., Ltd. 650
Willey & Co., Ltd. 648
Williams, John E., Ltd. 660
Williamson Cliff, Ltd. ... ...
Wilson, George, Gas Meters, Ltd. ... ...
Winn & Coales, Ltd. 662
Woodall-Duckham Vertical Retort & Oven Construction Co. (1920), Ltd. 675
Wood, Hugh, & Co., Ltd. ... ...
Wright, Alexander, & Co., Ltd. S2

Y

Yorkshire Copper Works, Ltd. ... ...

Appointments Vacant S3,S4
Appointments Wanted ... ...
Contracts Open ... ...
Educational ... ...
Financial ... ...
Miscellaneous ... ...
Notice ... ...
Patents ... ...
Plant For Sale & Wanted S4
Publications ... ...
Repairs S4



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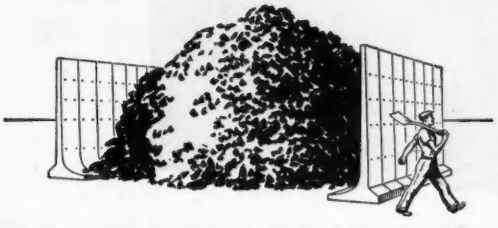

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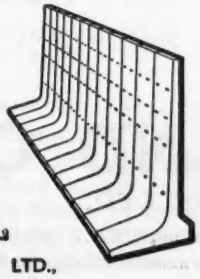

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Gas Journal

103rd YEAR OF PUBLICATION

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CONTENTS

Page

EDITORIAL COMMENT

Second Year's Working ... 667
Current Complications ... 668
Special Tariffs ... 669
Forcible Entry ... 669
Worsening Sulphur Shortage ... 670
Easing the Tax Burden ... 670

LETTER TO THE EDITOR

Shewring Fund. F. C. Shaw ... 670

NEWS OF CURRENT EVENTS

Personal ... 671
Obituary ... 671
Diary ... 671
The Second Year of Gas Nationalisation ... 672
Domestic Science Teachers Visit Gas Board ... 679
Gas Exhibit at Smithfield Show ... 681
Proposed Extensions at Oxford ... 682
Dearer Gas in Eastern Area ... 682
Trade News ... 693
Company News ... 694

CONSULTATIVE COUNCILS

Southern: Special Rates for Special Loads: Master Bakers' Appeal ... 680

IN PARLIAMENT

Two Important Committees Named; Fireguards Bill 682

TECHNICAL RECORD

Coal Travel in Continuous Vertical Retorts. By C. H. Lewis, M.Sc., M.Inst.Gas E., North Thames Gas Board ... 683
Producer Gas for Peak Hours. By D. J. Ward, M.Inst.Gas E., Assistant Engineer, Windsor Street Gasworks, West Midlands Gas Board ... 689

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GAS JOURNAL

VOL. 268. No. 4619 103RD YEAR DECEMBER 12, 1951

SECOND YEAR'S WORKING

ON Monday evening there were published the reports and statements of accounts of the Gas Council and the 12 area boards for the year ended March 31, 1951. There was inevitable time lag in the issue of the reports covering the 11 months to March 31, 1950, but in the present instance publication date has commendably been advanced by three months. Once again we have an extremely clear picture of the industry with all relevant detail well marshalled and set out. The 12 months covered was a period of consolidation. The industry is growing on very sure, if highly expensive, foundations and is entering more fully at every turn into the national economy. We have used the word 'expensive' here purely in relation to economic conditions involving the costs of raw materials, transport, labour, and so on, and not as a controversial pointer to the operation of the industry as a nationalised fuel unit. Basically we have no yardstick for comparison with the heterogeneous undertakings prior to 1949. Policy is so changed that overall comparison can only be invalid. Schemes of gas supply, theoretically sound generally before 1949—and indeed put into practice by the larger undertakings which were themselves grouped—are now going ahead on a national basis. The fabric of the reports of the area boards is woven with the thread of integration, and there is little doubt that not only is the supply of gas becoming more generally available, but that when new consumers are connected to the mains they can be assured of reasonable and proper service—which, after all, is the crux of the problem.

Our major impression on reading the reports of the Gas Council and of the individual area boards is concerned not with what the reports record statistically, but what they indicate; and what they indicate goes far beyond actual achievement, though this is solid enough. In the Gas Council report—and there is particularisation, of course, in the reports of the area boards—there is emphasis that in the industrial field, unless the area boards can obtain the new plant they require, supplies of gas will be in danger of failing. In the light of the rearmament programme the consequences will be world wide. That needs no stress from us. This dangerous situation affects more especially Scotland, the Midlands, and the North, where boards cannot accept many urgent industrial loads until new plant is brought into use. The position is most serious in the West Midlands. In the central divisions of the West Midlands Gas Board—this relates, of course, to the 12 months ended last March, and much has happened since then—industrial supplies to the tune of over 4,500 mill. cu.ft. a year had to be refused. In the remaining divisions of the Board similar requests for supplies totalling over 3,700 millions could not be met. This is serious and disturbing. It is also symptomatic, and we would strongly underline the following from the Gas Council report: 'The ability of the gas industry to play its full part in the industrial productivity of the country will depend on its receiving an adequate allocation of the capital investment programme and of the available supplies of steel, in addition to adequate supplies of coal and labour. Of these the most pressing immediate requirement is steel.' No responsible government can fail to heed this. It is a major element, in everyday fact, in the well-being of the nation. There are capital allocation claims from the electricity industry. Implementation of the defence programme and the general strength of industry depend largely on the availability of electric power. They depend also, we would emphasise, on the availability of gaseous heat. What is urgently called for, and what at the moment we sadly lack, is knowledge of the situation by governmental heads and governmental departments—knowledge which perforce must result in a better balanced outlook on the energy and fuel problem as a whole and a wiser allocation of the country's financial resources.

The major consideration, then, is that the powers of the gas industry are unleashed. The record of the industry in the Gas Council and area board reports is good. Increases in output of 5% or more on the gas industry's thermal business represent a large volume of heat. But, as we have said, increases of this order are not in keeping with the industry's potentialities now that it has been started on its integration stride. However, let us look at a few figures of the industry relating to March 31, 1951. In the 12 months under review the industry carbonised 26,368,700 tons of coal (an increase of 1,105,000 tons over the preceding 12 months); it gasified 556,700 tons of oil; it purchased from the coke ovens 318 mill. therms of gas, and it also bought a not inconsiderable quantity of oil refinery gases. Sales of gas totalled 2,460 mill. therms. The number of consumers at March 31 was 11,981,000. Financially the report showed a net surplus of £1,492,784, nine area boards showing a surplus on the year's working, three a deficit. British Gas Stock at March 31 was £228,648,328. These are bald figures, indicating the size of the British gas industry nine months ago. As an aftermath of rising costs of raw materials, plant, labour, and transport, the level of gas prices became higher. The average income per therm of gas supplied was 13d. (compared with 12.55d. for the 11 months to March 31, 1950), the average for domestic use being 14.8d., for industry 9.51d., for commence 13.18d., for public administration 12.01d., for public lighting 8.81d. Prices have been increased since March of this year by substantial amounts due to the same causes. In terms of prices nine months ago, increases in the costs of coal were equivalent to an increase in the gas industry's yearly expenditure of £5,500,000; transport, an additional £2,600,000; gas oil, £1,150,000. These figures relate, of course, to consumption as assessed at March 31; and costs have shown a rapid and unhealthy rise since, all of which makes comparisons not merely tedious but meaningless and swamps the effects of integration and the technical advances in gas making and distribution.

The foregoing are a few first thoughts arising from the gas industry's working in 1950-51. Integration of gas supplies is proceeding steadily. Wales is going ahead with the eastern and western gas grids in collaboration with the National Coal Board; Scotland is making progress in the linking and merging of undertakings; the North Western and the East Midlands boards have their own major schemes; the North Eastern is developing the West Yorkshire grid; the North Thames vast grid is practically a *fait accompli*; when the integration plans of the South Western Board are completed, only a limited number of major works will remain in being; in the Northern Board more than half the gas supplied comes from coke ovens. Delays in the delivery of materials, especially steel, for new plant is retarding integration plans, but the scope of these plans and their possibilities, and what has already been accomplished, are set out in the reports and they are indicative of 'things to come.' And in other directions, notably in the matter of tariff structures, one sees the drive towards rationalisation and uniformity. A few boards have been able to introduce tariffs which in their structure are common to the whole of their areas. The Northern Board, for example, introduced a uniform all-purpose tariff during the year. The Eastern Board, which replaced 466 tariffs by six, introduced, on the other hand, tariffs of uniform structure according to use. Irrespective of method, the aim has been to put charges on a more uniform and more rational basis. This aim is apparent in many other directions of gas service outlined in the reports.

CURRENT COMPLICATIONS

ON the day of release of the reports a Press conference was held at Gas Industry House, when Colonel H. C. Smith, Deputy Chairman, touched upon salient points in the Gas Council's report and invited questions. In a brief survey Colonel Smith spoke on the question of decentralisation in the gas industry's organisation. A common feature to all area boards, he emphasised, was the determination to delegate to the local managers as much executive authority as possible. This policy of delegation had been carried further during the year under review. Decentralisation had, in fact, been carried as far as it could be carried—indeed, it might be considered that in the event this policy of decentralisation had almost over-reached itself. After mentioning the increase in gas sales—a matter of some 120 mill. therms, a growth in itself representing more than the total output of the South Western Gas Board—he passed on to comment on the complications involved in securing permission to proceed with the establishment of new works. He described these complications as a 'very disturbing factor,' and he cited Oxford as a case in point. This case and others have been followed closely by the *Journal* and the proceedings at various protracted and inconclusive enquiries have been reported in our pages. The latest news about Oxford will be found in our issue today and the situation there has had prominence during the past week in the national Press. It is three years since permission was sought to extend the gasworks of the Oxford undertaking. Due to opposition and in spite of high-level enquiry into the question, it has proved impossible for the Southern Gas Board to alleviate the shortage of gas in the Oxford district. During this time, not only has there been serious wastage in planning and replanning, with suggested schemes falling to the ground through severely practical reasons; capital costs for plant and buildings, and so on—and, of course, labour charges—have increased greatly. Capital costs jumped by 15% in 1949-50; they jumped again by 20% in 1950-51. And the Oxford undertaking is where it started. Here is a bright example of delay costing money. Can we afford it? As we have said, Oxford is in the news. But this procrastination forced upon the development of gas is of country-wide occurrence and nation-wide significance. Colonel Smith referred to another black instance, this in the Black Country within the area of the West Midlands Gas Board. The complication here is unusual. As we have seen, the Board simply cannot supply loads which, when examined, are of vital importance. The Board proposed to erect an installation of coke ovens in its area. The local authority concerned opposed,

suggesting an alternative form of plant; the position is not yet resolved. Meanwhile the ability to satisfy industrial gas demand is being weakened.

Further points were elucidated in answer to questions at the Press conference, among them the inevitable further rise in gas prices which will result from the direct and indirect effects of higher coal charges consequent on miners' wage increases and the coal industry's price structure, and the seriousness of the turn-over in manpower within the gas industry. As the report of the Gas Council shows, while for the industry as a whole the labour force has remained steady in total, the turnover in 1950-51 was high, predominantly in the industrial districts. The West Midlands Board, with a total of 12,552 employees at March 31, had a recruitment of 6,134 and a loss of 5,854 during the year; and this high rate of turnover extends now even to office jobs where stability was previously the normal condition. It is not that the gas industry is unique in this respect, but under the conditions of today the competitive demands for labour are likely to increase. The rate of turnover inevitably affects production, particularly in the winter months.

Here, then, are certain of the complications confronting the gas industry and hampering its usefulness. That the industry is aware of them and is taking what measures it can to resolve them is satisfactory in itself but it cannot go beyond certain limits. And the extent of these limitations depends in the ultimate on the awareness of Ministries of the Government of the strength which the gas industry could bring to bear in solving the overall problem of heat supply if there was easing of the elements of unnecessary delay and frustration.

SPECIAL TARIFFS

AT its meeting last week the Southern Gas Consultative Council considered the arguments of a deputation from the Berks Master Bakers' and Confectioners' Association protesting strongly against the revised tariffs of the Southern Gas Board, which new tariffs, the deputation maintained, hit bakers badly in the Board's area, the while special tariffs for bakers are in force in the areas of at least three other boards. The Council, impressed, viewed the matter as of sufficient importance to warrant a close investigation and an emergency meeting next month when all the facts have been marshalled. The issue comes under Section 53 of the Gas Act, which empowers an area board to enter into a special agreement with any consumer for the supply of gas to him as may be specified in the agreement—provided that an area board shall not enter into such agreements except in cases where the tariffs in force are not appropriate owing to special circumstances. And sub-section 7 provides that an area board, in fixing tariffs and making agreements shall not show undue preference to any person or class of persons and shall not exercise any undue discrimination against any person or class of person. Obviously a great deal hinges on the interpretation of the word 'undue.' The bakers' contention was that the Southern Gas Board had not given them their 'due' in relation to the characteristics of the load involved and in comparison with practice current in other parts of the country. The Consultative Council was of opinion, as we have indicated, that the deputation from the Bakers' Association had very definitely a case which could not summarily be dismissed.

Interpretation in practice of Section 53 of the Gas Act, a matter for each area board, must necessarily depend on local circumstances—the characteristics of a particular load in an area and the possibilities and economics of supplying that particular load. Conditions can and in fact do differ between the several areas, but it is questionable whether these differences should have such varied effect on the framing of tariff policy. Arguments considered by the Southern Gas Consultative Council last week related solely to the baking load, but recently similar broad contentions have been brought to bear on the central heating load. Why, for example, should an area board offer advantageous rates for central heating by means of a hot water system and at the same time exclude from the special provisions alternative equipment performing the same function and with, broadly, similar load factor? But that perhaps transgresses beyond the purpose of this note. What stands out is that here we have an example of a consultative council on its toes, performing its accredited function. And we shall look forward to the debate at its promised emergency meeting.

FORCIBLE ENTRY

SINCE the Court of Appeal upheld the decision in the King's Bench Division that the Eastern Gas Board was acting within the powers conferred upon it by the Gas Act, 1948, in authorising one of its inspectors to make forcible entry into the house of a consumer absent on holiday for the purpose of collecting money from the coin box of a prepayment meter there has been much public comment on the implications involved. Nowhere have we seen or heard a serious suggestion that an area board or any of its responsible officers would wantonly intrude on the privacy of a consumer's home or that any kind of physical force would be exerted until every possible alternative had been explored. There now appears to be a new—and largely unfounded—fear that inspectors breaking into premises on behalf of area boards may be mistaken for housebreakers. It found expression at the November meeting of the North Thames Gas Consultative Council, and it cropped up again at the South Eastern Consultative Council on December 4. As we have already reported, the North Thames Council resolved to ask the Minister to consider an amendment to the Act whereby both gas board official and consumer would be protected at the time of a forcible entry by the presence of a police officer. At the South Eastern meeting it was deemed to be 'wise and proper' to ask the police to be present when a house was entered by a gas inspector and for the police to be notified of the intention to enter and also when the operation was completed. One of the district committees asked the Council to resolve that notwithstanding the Board's legal rights, forcible entry should be undertaken only in cases of emergency and after due notice, but as such conditions are already covered in the Act the motion was defeated. The chances of a

housebreaker being mistaken for a meter reader are no less real, and if police supervision is to be provided in cases of forcible entry there would seem to be no reason for not having a policeman present every time a man who claims to be a meter inspector seeks admission in the normal way.

WORSENING SULPHUR SHORTAGE

STATISTICS released last week by the Sulphur Committee of the International Materials Conference in Washington and published in Britain by the Ministry of Materials indicate the increasing seriousness of the free world's sulphur shortage. Stressing the seriousness of the shortage the Committee records that the United States representative stated that the recent discovery of a new sulphur dome in Louisiana did not relieve the pressure for a vigorous prosecution of the Committee's recommendations. It is expected that some of the output from the new discovery, which is not expected to reach full production until late in 1953, will be partially offset by declining output elsewhere. This year world requirements of both crude and refined sulphur amount to about 7,134,200 long tons, whereas production is expected to amount to 5,862,300 tons, leaving a shortage of 1,271,900 tons. Next year requirements are estimated at 7,596,300 tons and production at 6,255,600 tons, leaving a shortage of 1,340,700 tons. The Committee urges Governments to increase production of sulphur and all sulphur-bearing materials, and emphasises the need for the most economical use of available supplies. Its figures are based on information received from interested Governments. The demand for sulphur, as such, is this year 32% higher than in 1949 and will go up again by 8% next year as the result of the expansion in the uses of sulphuric acid, sulphur dioxide, and carbon bisulphide in various industries.

EASING THE TAX BURDEN

THE Income Tax Payers' Society has sent us a copy of a memorandum comprising replies to a series of questions submitted to the Society by the Royal Commission on the Taxation of Profits and Income now sitting in London. The Society puts forward its suggestions 'with some diffidence' in view of the wording of the terms of reference laid down for the Commission and in particular the restriction that only 'recommendations consistent with maintaining the same total yield of the existing duties in relation to the national income' will receive consideration. Proposals by the Society, by reason of its very aims and objects, must necessarily be in the direction of relieving the financial burden on tax payers in general and in reducing taxation. It suggests that taxation of United Kingdom residents (companies or individuals) in profits earned abroad will cause new companies to avoid 'residence' here, and the country will lose by this. Easter offerings and similar voluntary payments should be exempt from tax; this would give much needed relief to a section of the community which has had no increase in emoluments in recent years and is particularly hard pressed by the rise in the cost of living. The capital content of life annuities should also be tax free.

The Society believes that P.A.Y.E. should not be abolished; an attempt should be made to evolve a revised scheme to do away with the apparent taxation of overtime earnings at the highest rate. Deductions for outgoings and expenses should, it is urged, be enlarged to cover many more expenses closely connected with a trade or business, and losses should be allowed to be carried forward indefinitely. Provisions for double taxation relief should be simplified; personal allowances should be increased; the housekeeper allowance should be extended to spinsters and bachelors; and costs of appeal against Commissioners' assessments should be allowed the successful litigant as are costs in the High Court.

Letter to the Editor

SHEWRING FUND

DEAR SIR,—It will be recalled that the late Mr. W. Rupert King, then Editor of the *Gas Journal*, kindly opened a Fund in 1936 for the benefit of the widow of Mr. H. Shewring, Engineer and Manager of the Cambridge University and Town Gas Light Company, formerly at Rochdale, who lost his life in a gallant attempt to rescue his friend overboard from a yacht in the Channel on April 14, 1936.

In this we had the hearty co-operation of the Editors of the *Gas World* and the *Gas Times*, and many generous subscribers. The fund was deposited with the Trustee Department of the Post Office Savings Bank, with Mrs. A. E. M. Shewring as the named sole beneficiary, with a local P.O. savings bank account, subject to the decision of three trustees to authorise transfers from the fund, until the infant daughter had obtained a start in life. Of the three children left by Mr. Shewring, the eldest, Peter, has had a distinguished career in the Royal Navy in the late war, being second in command of a submarine and mentioned in dispatches for operations against the Japanese. He is now back with Radiation Ltd. The younger son, Ronald, after Army Service is employed by Mander Bros., and the only daughter, Barbara, has recently entered the Sheffield Teachers Training College, with a grant from the West Bromwich Education Committee.

During the years that have elapsed, Mrs. Shewring has won the hearty admiration of the trustees by her untiring industry and efforts under great difficulties, always with great courage and cheerfulness. To mention two instances:—1. Her place of employment was completely gutted by a bomb in the Birmingham blitz, and (2) she had the care of her mother who was blind and bedfast for many years to a great age. She has endeavoured to draw on the fund as little as possible, as she wished to have the benefit when she was no longer capable of hard work. The fund now stands at £804 10s. 10d., plus the interest for the current year, and it has been decided to transfer the full control of this sum to Mrs. Shewring, and the trustees' duties will now cease. Mrs. Shewring has repeatedly expressed what a blessing the fund has been to her.

Mr. Rowland Walker, of Manchester, Mr. J. Hunter Rioch, of Cambridge, and myself, the retiring trustees, can assure the generous subscribers to the fund that, in their opinion, there has rarely been a better case of successfully helping a widow to help herself, by her own efforts and industry, than this one.

Mrs. Shewring resides at Hamstead Cottage, 146, Hamstead Road, Great Barr, Birmingham, 22 A.

Yours, faithfully.

F. G. SHAW,
Acting Secretary, Shewring Fund.

'Sherwood,'
Craven Brow,
Blackburn.
November 30th, 1951

The British Standards Institution has published recently a British Standard devoted to street lighting lanterns designed for lighting all classes of public thoroughfares. The standard is in two parts, the first being devoted to lanterns for electric lighting and the second part to lanterns for gas lighting. Both parts deal with the mechanical and constructional features of lanterns, exclusive of auxiliaries and lamps in the case of electricity, and excluding governors, ignition devices, and controllers in the case of lighting by gas. The standard is intended to make for safety, durability and ease of maintenance, but it does not purport to cover photometric requirements. This standard will be a useful addition to the Code of Practice for Street Lighting, Part 1 of which will be published shortly. Copies of the standard may be obtained from the British Standards Institution, Sales Department, 24, Victoria Street, London, S.W.1, price 3s., post free.

Personal

Mr. J. C. Campbell, chief London representative of Keith Blackman, Ltd., retired last month after 50 years' service. During that time he represented the company in Edinburgh and Glasgow, and has been chief London representative for the past 14 years. His successor is **Mr. D. J. Auld,** who has been with the company since 1914, and a representative for the past 27 years, including service in Manchester.

◇ ◇ ◇

Mr. W. George Bowen, Showroom Supervisor, Gloucester unit, South Western Gas Board, has been appointed Sales and Service Superintendent to the Swansea undertaking of the Wales Gas Board and will commence his new duties on January 1 next. During his 16 years service at Gloucester, Mr. Bowen has seen considerable expansion and he now returns to the place where his employment in the industry started.

◇ ◇ ◇

Mr. Gordon Kirby has relinquished his post as technical engineer assistant at Uddingston gasworks on his appointment as Constructional and Maintenance Engineer at Brisbane gasworks, Australia. He sails with his wife and two children on December 20. He went to Uddingston three-and-a-half years ago. Mr. Kirby has been presented with a clock from his Uddingston colleagues. The gift was handed over by Mr. Fred R. Mitchell, Group Manager of the Lanarkshire area of the Scottish Gas Board.

◇ ◇ ◇

Mr. George H. Newman has been appointed Organising Officer for Gas Staffs at the headquarters of the National Association of Local Government Officers. He joined the staff of the Association in March, 1946, as a district officer in the Metropolitan District, later taking charge of the South Western District, where he held the positions of Joint Secretary to the South Western Area Joint Council for Gas Staffs and Joint Secretary to the South Western Area Joint Standing Committee for Intermediate Grades.

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Mr. Ernest Galley, of Radiation Group Sales Ltd., (Gas Appliances advertising), has left hospital at Guildford after five weeks' treatment for omoebic dysentery, which he believes he contracted either in North Africa in 1935, or during a trip to Hungary with the late G. H. Grimaldi ('Grim.') in the summer of 1938, when they collected a couple of the famous Lippizaner horse at the Austrian frontier and rode from there to the shores of Lake Balaton, averaging 40 to 50 miles a day. Mr. Galley joined Radiation in January, 1946, coming from the European Division of the British Broadcasting Corporation, where he was Editor of the Radio News Service to the enemy-occupied Netherlands and Netherlands Indies, and occasional correspondent with the free Dutch Naval Forces. For these services, Queen Juliana conferred upon him the knighthood of the Order of Oranje Nassau.

Obituary

Mr. William Richard Day, who was Manager of the Banbury Gas Company from 1931 to 1945, when he resigned through ill-health, has died at his home at Banbury. Mr. Day began his career in the gas offices at Lewes, but returned to Banbury, his native town, in 1907, where he entered the service of the Gas Company, in which he remained for over 40 years. He became Secretary in 1922 and Manager in 1931. In October, 1940, when a lone German raider dropped a stick of bombs which demolished two gasholders and damaged a third, his home was damaged. He was in the office at the time and, with his staff, had a remarkable escape.

◇ ◇ ◇

Mr. J. Hughes Cornish, for many years Managing Director of the former Bridgwater Gas Light Company, died on December 4 in his 83rd year after a very short illness. Mr. Cornish started his business life at the Bridgwater works under his father, who was Engineer and Manager for a period of 45 years. After five years he left and joined a firm of electrical engineers and had four years' practical work on electrical matters, during which time he was employed on various contracts throughout Great Britain and in America. On the completion of a big contract in New York he returned to Bridgwater to superintend the erection of a new holder and tank. When that job was finished he entered the service of Edward Cockey and Sons, Ltd., Frome, as draughtsman. Two years later he was appointed Engineer, Manager, and Secretary of the Bridport Gas Company on the death of Mr. T. Giles, and remained in that office for nine years. In 1904 his father contemplated retiring, and Mr. Cornish was asked if he would apply for the position. He was duly appointed, and continued as Engineer, Manager, and Secretary for 26 years, until 1930, when his son, who is now Sub-Divisional Production Engineer under the South Western Gas Board at Taunton, was appointed to the position. Mr. J. H. Cornish, Senr., became Managing Director and they continued to work together until nationalisation, when Mr. Cornish retired after 45 years service. Thus the office of Engineer, Manager, and Secretary of the Bridgwater undertaking was held continuously by James Hughes Cornish (three generations) for 90 years. Mr. Cornish had been a member of the Institution of Gas Engineers since the Presidency of Mr. W. R. Chester (1896), a member of the former Southern Association of Gas Engineers and Managers since 1895 and President of that Association in 1933, and latterly an Hon. Member. He served on the Council of the Institution from 1933 to 1935, and before nationalisation he was a Director of the Burnham-on-Sea Gas Company and was interested in many undertakings as consultant.

Diary

Dec. 14.—London and Southern Juniors: 'Gasworks Chemical Control,' P. C. Bishop (Tunbridge Wells), 178-180, Edgware Road, W.2, 6.30 p.m.

Dec. 14.—Manchester and District Section, I.G.E.: 'The Economics of Gas Production,' T. Nicklin, M.SC., Production Engineer, North Western Gas Board. Grand Hotel, Manchester, preceded by luncheon.

Dec. 15.—Yorkshire Juniors: 'Carbonisation,' J. Burbridge, Gas Shrowrooms, Daveygate, York, 2.30 p.m.

Dec. 18.—London and Southern Section, I.G.E.: 'Recent Developments in Oxide Purification Plants,' G. U. Hopton (Research Chemist, North Thames Gas Board). 17, Grosvenor Crescent, 2.30 p.m.

Dec. 18.—Institute of Fuel: 'Gasification by the Moving-Burden Technique,' by J. W. R. Rayner; Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W.1, 5.30 p.m.

Dec. 19.—London and Southern Juniors: Visit to Elliott Brothers (London), Ltd., Century Works, Lewisham, 2.30 p.m.

Jan. 1.—East Midlands G.C.C.: Victoria Station Hotel, Nottingham, 11 a.m.

Jan. 4.—London and Southern Juniors: 'Technical and Sales Requirements for Appliances,' G. H. Fuidge, Chief Physicist, South Eastern Gas Board; 178-180, Edgware Road, W.2, 6.30 p.m.

Jan. 12.—Western Juniors: Presentation of papers by Student Members, Taunton.

Jan. 14.—West Midlands G.C.C.: Dudley Room, Queen's Hotel, Birmingham, 2.30 p.m.

Jan. 15.—London and Southern Section, I.G.E.: 'Industrial Applications of the Gas Turbine,' A. W. Pope (W. H. Allen, Sons, & Co., Ltd., Bedford). 17, Grosvenor Crescent, 2.30 p.m.

Jan. 15.—Chemical Engineering Group: 'The Patent Act of 1949,' Norman Brown. Burlington House.

Jan. 16.—Eastern Juniors and London and Southern Juniors: Joint Meeting. Visit to Chelmsford.

Jan. 16.—Yorkshire Juniors: 'Electricity in Gasworks,' W. Blakeley (Chief Engineer's Department, North Eastern Gas Board), preceded by visit to Kirkstall power station.

THE SECOND YEAR OF

The Gas Council's

Within nine months of the end of the period to which they relate, the second annual reports and statements of accounts of the Gas Council and the 12 area boards, covering the year ended March 31 this year, were published on Monday. Those relating to the first year of nationalisation, ended March 31, 1950, have been almost a year behind. Total income from the sale of gas in 1950-51 was £133.3 mill., compared with £111.4 mill. for first 11 months of State ownership. The quantity sold was 2,460 mill. therms, an increase of approximately 5%, and consumers increased by 120,000 to a new total of 11,981,000. The industry produced a net surplus of £1,492,784, nine of the area boards showing a surplus and three a deficit on the year's working. We confine our present summary to the Gas Council report; those of the area boards will be summarised later.

THE aggregate result of the second year's operations of the area boards, after providing £6,784,661 for interest on British Gas Stock and a contribution of £350,000 to the central guarantee fund, but before transfers to reserve and obsolescence funds, comprised surpluses from nine boards (totalling £2,079,192), less deficiencies from three boards (£573,166), making a net surplus of £1,506,026, compared with a net deficiency for the 11 months ended March 31, 1950, of £10,579. Gas Council expenditure is met by contributions from the area boards, and the aim is to call for such contributions as will balance income and expenditure. For the first financial year there was a surplus of £13,242; for the year now under review the contributions were so calculated as to leave a deficiency of an equal amount. To arrive at the results for the whole industry, the Gas Council's deficiency is deducted from net surplus, leaving £1,492,784.

The results of the individual boards' operations for the year, after providing for contributions to the central guarantee fund, are shown in Table 1.

Gross revenue for the industry was £233.5 mill., which includes £133.3 mill. from the sale of gas, £63.2 mill. from disposal of by-products, £23.4 mill. from sale and hire purchase of appliances, £8 mill. from rentals of meters, appliances, and fittings, and £5.6 mill. from other sources. The number of therms of gas sold by all boards and the income derived therefrom were as shown in Table 2. Exact comparison is not practicable as the first accounts were for a broken period of 11 months, but subject to that qualification the report says the sales of gas for the year may be taken as being approximately 5% greater than those for the previous 12 months; 'thus the general post-war upward trend of total demand for gas has been maintained.'

TABLE 1.—FINANCIAL RESULTS OF EACH AREA BOARD

Board	Results of operations for 1950-51 Surplus (+) Deficiency (−)	Balances brought forward at April 1, 1950 Surplus (+) Deficiency (−)	Additional Net Income for eleven months to March 31, 1950	Disposable Surplus or Net deficiency	Placed to		Balances carried forward at March 31, 1951 Surplus (+) Deficiency (−)
					Reserve Fund	Replacement and Obsolescence Reserves	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	£	£	£	£	£	£	£
Scottish	+ 154,525	− 283,876	—	− 129,351	—	—	− 129,351
Northern	+ 11,204	+ 5,256	—	+ 16,460	—	—	+ 16,460
North Western	− 350,533	+ 1,119	44,641	− 304,773	—	—	− 304,773
North Eastern	− 53,348	+ 6,670	92,261	+ 45,583	—	—	+ 45,583
East Midlands	+ 280,644	+ 92,792	—	+ 373,436	150,000	50,000	+ 173,436
West Midlands	+ 151,480	+ 117,632	—	+ 269,112	50,000	50,000	+ 169,112
Wales	+ 182,468	+ 25,141	—	+ 207,609	65,000	75,000	+ 67,609
Eastern	− 169,285	− 246,859	168,908	− 247,236	—	—	− 247,236
North Thames	+ 313,559	+ 456,085	—	+ 769,644	100,000	200,000	+ 469,644
South Eastern	+ 588,987	+ 113,060	102,773	+ 804,820	300,000	200,000	+ 304,820
Southern	+ 124,587	− 97,566	24,076	+ 51,097	—	50,000	+ 1,097
South Western	+ 271,738	− 570,033	13,126	− 285,169	—	—	− 285,169
	+1,506,026	− 380,579	445,785	+1,571,232	665,000	625,000	+ 281,232

Cost of Gas

The cost of gas produced and purchased was £133.8 mill. which is reduced to £84.2 mill. by the deduction of £49.6 mill. revenue from the disposal of by-products. The net figure represents an average cost of 8.22d. per therm of gas sold. The total net cost is made up of—

	£mill.	£mill.
Cost of raw materials (including handling)—		
Coal	86.3	
Oil	6.8	
Coke for water gas	5.3	
		98.4
Cost of gas purchased (crude and purified)		4.0
Process wages		8.7
Maintenance of buildings and plant (including wages)		10.7
Other charges (including wages)		12.0
		133.8

TABLE 2.

Supply	Gas Sold		Income from sales		Average income per therm sold
	Therms (000's)	%	£mill.	%	d.
Domestic	1,391,737	56·57	85·83	64·40	14·80
Industrial	589,642	23·97	23·39	17·55	9·51
Commercial	310,225	12·61	17·03	12·78	13·18
Public Administration	56,644	2·30	2·84	2·13	12·01
Public Lighting	53,343	2·17	1·96	1·47	8·81
	2,401,591	97·62	131·05	98·33	13·08
Bulk Supplies to other Boards	680	0·03	0·03	0·02	10·89
Gas used for own purposes	57,923	2·35	2·19	1·65	9·08
	2,460,194	100·00	133·27	100·00	13·00

GAS NATIONALISATION

Report for 1950-1951

Deduct—

Income from by-products (*less* direct charged) ...	49.6
£mill.	84.2

Nothing is included in these figures for interest, depreciation and other charges such as administrative expenses.

Table 3 shows the aggregate yield from the disposal of by-products.

TABLE 3.—BY-PRODUCTS.

	Sales and used for own purposes	Direct Charges	Net Income
	£mill.	£mill.	£mill.
Coke and Breeze	49·5	7·3	42·2
Tar and Tar Products	9·2	2·4	6·8
Benzole and Benzole Products ...	2·8	2·4	0·4
Ammonia and Ammonia Products ...	1·5	1·4	0·1
Other By-Products	0·2	0·1	0·1
	63·2	13·6	49·6

The industrial load is not equally distributed between boards and ranges from 7.59% of the total sales (or 8.6 mill. therms) in the case of the Southern Gas Board to 42.68% (105.6 mill. therms) for the East Midlands, and 44.85% (133.3 mill. therms) for the West Midlands, the largest industrial sales of any board.

The average income per therm of gas supplied was 13d. compared with 12.55d. for the 11 months to March 31, 1950, the average for domestic use being 14.8d., for industry 9.51d., for commercial use 13.18d., for public administration 12.01d., and for public lighting 8.81d.

Total British Gas Stock issued up to March 31, 1951, was £228,648,328, of which £188,648,328 was in respect of compensation issued to holders of securities in former gas undertakings. It was estimated that a further £433,970 would be needed in respect of securities not valued at that date. Interest on British Gas Stock for the 12 months, plus the estimate of that ultimately payable on stock to be issued in respect of unvalued securities, was £6,879,011, of which £6,874,661 has been recovered from boards, the balance being attributable to the Gas Council.

Gas Industry House

The departmental organisation of the Gas Council has remained unchanged, the number of employees at March 31 (excluding maintenance and canteen staff) being 167 compared with 159 a year earlier. The small addition is explained by increased responsibilities placed on the accountancy and industrial relations departments and the greater demands made on the common services provided for all departments, such as typing and telephones. Distribution of staff among the departments is shown in following Table 4.

TABLE 4.

Department	Numbers employed Men	Women	Total
Secretarial (including legal, registration and general services)	16	25	41
Accountants	9	8	17
Industrial relations ...	5	7	12
Coal and coke	12	39	51
Publicity, Press, and information	20	26	46
TOTALS	62	105	167

About half the staff included in the coal and coke department figures are engaged on work previously undertaken by the London and Counties Coke Association and now continued at their request on behalf of the five boards whose areas cover the territory of that former Association.

The staff at March 31 was only 10 more than the combined staffs of the organisations stationed at Gas Industry House immediately before vesting day and the report places on record the Gas Council's appreciation of the efforts of the staff during a year 'which was by no means easy.' That the Council has been able to keep the number of staff to this level is due in no small measure to the fact that it can call on the technical resources of the boards and on those of the Institution of Gas Engineers.

Area Board Results

Table 5 gives a summary of gas sales, revenue, consumers, and persons employed by the 12 area boards. The figures are extracted from several of the tables printed in the Gas Council's report.

Reviewing the operations of the area boards the report says that the second year was a period of consolidation and also, within the limits imposed by restricted supplies of materials and other economic conditions, one of steady progress in all branches of activity. The greater part of the constructional work in hand or completed during the year consisted still of schemes initiated before vesting date; but schemes planned by the boards, particularly for the transmission and distribution of gas, became a steadily larger proportion of the whole. In many places where the standard was low there were improvements both in the quality of the gas and in service to consumers.

Organisation of the nationalised industry was from the start marked by a determination to delegate to local managers as much executive authority as possible, but it was made flexible enough to allow of any modification which experience might show to be desirable. Generally speaking, while here and there adjustments were made in boundaries of divisions or groups, the structure built up during the first year proved sound and was continued during the second. The policy of delegation was carried further and unity of the area was confirmed by a more regular system of conferences and consultations between area headquarters and their divisional and group managers.

Office Accommodation

'Office accommodation remains a difficulty for a number of the boards,' says the report. 'Some were fortunate in taking over underakings with headquarters suitable to be the headquarters of a board. Others, especially those whose areas contained no very large undertaking or had a preponderance of local authority undertakings, were in a less happy position. In the North Western area, for example, the headquarters technical staff at present is separated by some two miles from the board's administrative headquarters, which are themselves wholly inadequate for their purpose and are also wrongly sited. For the efficient control of production and distribution throughout the area facilities must be provided for the technical staff at the headquarters of the board, and since a prolonged search has produced no suitable existing building, new construction will be necessary.'

TABLE 5.—AREA BOARD RESULTS

Gas Board	Gas Sales Mill. therms	Revenue	Consumers	Persons employed Male	Female
Scottish	205	£10,711,104	1,199,038	9,733	831
Northern	146	£5,281,936	652,766	6,251	485
North Western	338	£16,808,053	1,716,738	16,870	1,393
North Eastern	144	£7,328,257	841,674	8,096	513
East Midlands	247	£10,183,107	1,054,481	9,634	754
West Midlands	297	£14,661,005	1,020,550	11,342	1,210
Wales	71	£4,135,235	417,837	4,231	343
Eastern	125	£8,080,406	671,167	8,198	953
North Thames	380	£22,392,081	1,783,534	22,784	1,674
South Eastern	276	£18,401,266	1,454,690	19,464	2,177
Southern	114	£7,405,482	544,845	7,055	588
South Western	117	£7,878,831	623,787	8,025	735
Gas Council	—	—	—	67	132
TOTAL	2,460	£133,266,673	11,981,107	131,750	11,756

In the East Midlands area the headquarters staff has had to be spread, not merely over separate buildings in the same city but over two cities. Nor is the difficulty confined to the headquarters of a board. In the divisions and groups, where much depends on adequate facilities for divisional and group accountancy, suitable premises have been hard to find in many cases. This, after two and a half years' search, has been the experience of the West Midlands Board, which has found it necessary to erect concrete prefabricated huts in some of its divisions.

In many places boards had to take over clerical and accountancy work formerly done in the offices of local authorities, and these offices are not available to them. The importance of proper offices as an aid to efficient and economical administration is very much in the minds of the area boards, who are doing their utmost to overcome their difficulties. In some instances the solution lies more with the town planning and central government authorities, whose consents are required, than with the boards themselves.

Heavy Construction Programmes

All the boards are engaged in heavy programmes for construction of manufacturing plant needed first to maintain existing capacities as old plant comes to the end of its useful life or obsolete plant requires replacement, and secondly to provide for known increased demands, and thirdly to carry out plans for integration. For example, the West Midlands Board, with an installed capacity of 281.5 mill. cu.ft. per day at March 31, 1951, of which 19 mill. cu.ft. per day was added during the year, has under construction or on order plant to the capacity of 80 mill. cu.ft. per day; the North Thames Board, with a total installed capacity of 369.4 mill. cu.ft. has under construction or on order plant to the capacity of 71 mill. cu.ft.; and the North Western Board, with 325.7 mill. cu.ft. day, had under construction at the end of the year plant to the capacity of 71.7 mill. cu.ft. per day.

Progress in completion of plant was seriously retarded by delays in delivery of materials, especially steel, and the position was becoming more acute towards the end of the year. Boards succeeded in maintaining supplies of gas through the long winter, and reductions of pressure were few, although many undertakings had record outputs. Their success was due partly to the new plant which they had been able to bring into commission; it was also due in no small measure to improved yields of gas and coke through more efficient working. Plant was, however, extended to the utmost, and the need for additional plant is urgent.

Demands Increasing

Demands for gas, particularly for industries engaged in the re-armament programme, are increasing, and unless area boards can obtain new plant supplies of gas will be in danger of failing. This applies particularly to Scotland, the midlands, and the north, where boards cannot accept many proffered industrial loads until new plant is brought into use. The position is most acute in the West Midlands, where 44.85% of all gas sold during the year was supplied to industry. In the central divisions (Birmingham and the Black Country) 78 requests for industrial supplies, each exceeding 4 mill. cu.ft. a year and aggregating 4,517 mill. cu.ft., had to be refused, and in the remaining divisions 66 similar requests for supplies totalling 3,704 mill. cu.ft. could not be met.

An outstanding example was that of a firm requiring as much as 5.5 mill. cu.ft. a day within two years—a quantity which would absorb the total output of the nearest gasworks serving a population of 115,000. Boards in the south of England have not in general had to refuse new loads, but they all anticipate that heavily increased demands will be made on them which they will not be able to meet from their existing plant.

Steel Shortage

The ability of the gas industry to play its full part in the industrial productivity of the country will depend on its receiving an adequate allocation of the capital investment programme and of the available supplies of steel, in addition to adequate supplies of coal and labour. Of these the most pressing immediate requirement is steel.

The report records the increasing use of carburetted water gas plants. Although normally regarded as a peak load plant extensive use has now to be made of water gas manufacture for the ordinary base load. Reference is also made to the growing use of coke ovens in the gas industry. The two new batteries at East Greenwich were inaugurated by the Duke of Gloucester during the year under review, and the report states that an order has been placed for a third battery. The North Western Board proposes to install at Partington, Manchester, a coke oven plant with an initial capacity of 15 mill. cu.ft. per day and with provision for extensions to an ultimate capacity of 30 mill. cu.ft. The Board has also prepared plans for the construction of a similar plant with an initial capacity of 10 mill. cu.ft. at Crewe.

Integration Schemes

Progress with schemes for the interconnection and integration of supplies was impeded by delays in the delivery of materials, chiefly cast iron pipes, but substantial headway was made. It has been possible since vesting date to discontinue production at 50 of the smaller works, supplies coming from larger stations with a resultant gain in economy, efficiency, and consumer service. The report refers in detail to the two major grid schemes in South Wales, the linking and merging of a number of undertakings in Scotland, the North Western schemes for integration in Lancashire, based largely on the Manchester manufacturing stations, and in north and mid Cheshire, and to progress in the East Midlands, North East, South Western and North Thames areas. In contrast to works closed down, mention is made of one place where the reverse process has occurred. At Crickhowell, Breconshire, the works was closed down some years before nationalisation and the gas supply ceased. The Wales Board, after attending to the distribution system, has started up the manufacturing plant again.

In the year under review just over half the gas supplied by the Northern Gas Board (50.69%) and the Wales Gas Board (50.4%) came from coke ovens owned by the National Coal Board, the steel industry and others, while 49.1% of the gas sold in the East Midlands came from similar sources. Co-ordination of the carbonising activities of the gas industry and the coke ovens is of the utmost importance if the best use is to be made of the coal processed by them.

The Gas Council is watching with interest the experiments being carried out by the Wales Gas Board in the use of mixtures of butane, obtained from oil refineries, and air, to meet the problems of gas supplies in isolated localities. After inspection of methods in operation at various gasworks in France, orders were placed with British manufacturers for three butane/air plants, which are now about to come into operation.

Enquiry on Shortage

Programmes for the repair of existing gasholders and the construction of new holders are reported to have been seriously retarded by delays in the delivery of steel. High pressure holders are being installed in some areas to maintain pressures at peak load periods. Attention is being paid to the siting and design of holders in relation to their surroundings. At the suggestion of the Ministry of Fuel and Power the Gas Council has joined in an enquiry into the latest methods of storing gas, the comparative cost of these methods, and the question whether any changes in method are practicable with a view to the preservation of amenities.

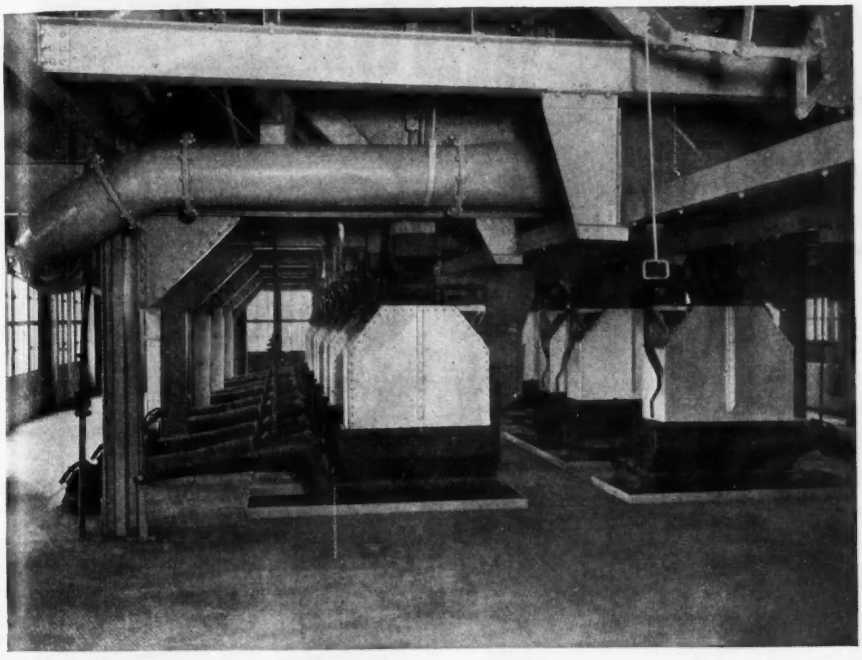
The report reviews the substantial progress made in achieving more uniform structures for gas tariffs. The system finding the greatest favour is the block tariff, by which large consumers have the benefit of prices progressively reduced as consumption increases.

TABLE 6.

Material or Service	Increase: Amount	Increase: Date	Estimated total cost to the industry for a full year
Coal	4s. 2d. per ton	Feb. 5, 1951	£5,500,000
Gas oil	1¼ per gal. (total increase)	Successive dates	1,150,000
Coal transport:			
Railway and canal charges	16⅔%	May 15, 1950	2,600,000
Dock dues	20%	May 15, 1950	
Road haulage charges	Varying amounts up to a total of £17½%	May, 1950 Feb. 1951	
Coastwise shipping freights	10% to 15%	March 1, 1951	
			Total £9,250,000

Increases during the year in the costs of coal, gas oil, and other materials, freight, petrol, and labour were too great to be absorbed by the economies which boards made in their general running, and revisions of prices for gas became necessary. Three boards, having regard

(*Concluded on page 679*)



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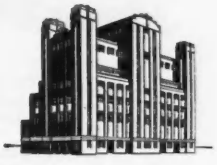

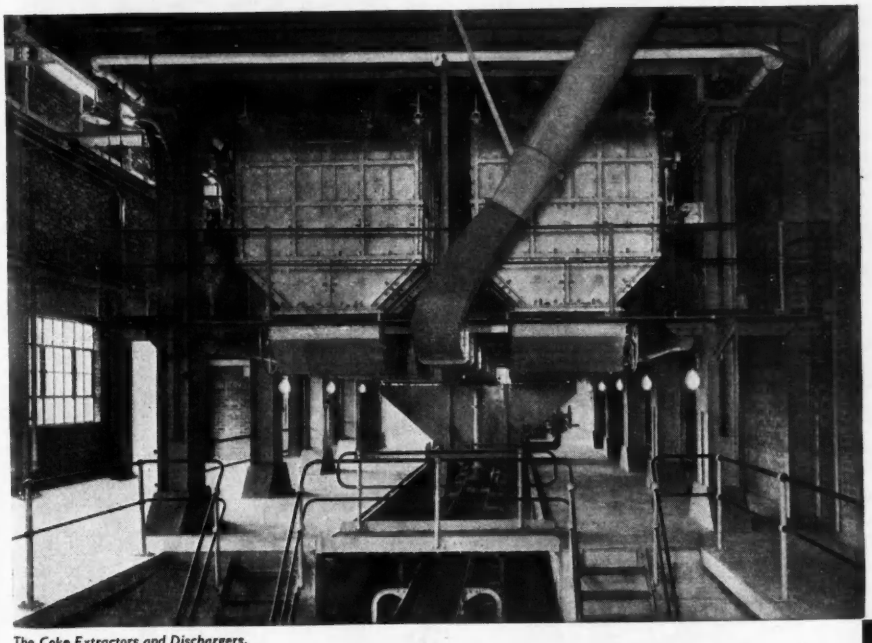

The Coke Extractors and Dischargers.

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VERTICAL RETORT & OVEN CONSTRUCTION COMPANY (1920) LTD.

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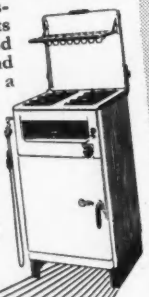
28th November 1951

Most precious possession

Three wise men, being once asked what was life's most precious possession, replied severally: Good Health: A True Friend: A Loving Wife.

Asked the same question today, they would reply in unison: A NEW WORLD 1840 GAS COOKER. With or without benefit of philosophers, the household which has one of these incomparable cookers enjoys all three most precious possessions. For good health waits upon good cooking; a good cooker is a true friend; and a happy cook makes a loving wife.

See the NEW WORLD 1840 Gas Cooker at your nearest Gas Showrooms and find out for yourself why more than two million loving wives say:



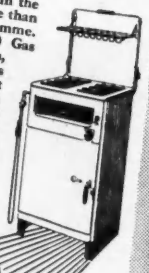
...it's a NEW WORLD PRODUCT OF Radiation Ltd for me!

31st October 1951

"A thing of beauty is a constant joy"

So wrote Keats originally, with more accuracy than in his later version about "a joy for ever". There was no gas cooker in the poet's Hampstead kitchen. If there had been, it is doubtful—industrial design of the period being what it was—whether it would have inspired him with a sentiment so admirable.

Today—in an æsthetically more self-conscious, if not more sensitive age—there may often be more poetry in the lines of a kitchen appliance than there is in the Third Programme. The NEW WORLD 1840 Gas Cooker doesn't write sonnets, but does produce meals which may be lyrical. That it is a thing of beauty you may see in the picture on the right. That it is a constant joy more than two million users of NEW WORLD Gas Cookers will testify. We suggest that you see this distinguished appliance in your nearest Gas Showrooms.



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PUNCH OR THE LONDON CHARIVARI—WEDNESDAY, OCTOBER 31 1951

6D

NEW WORLD NEW WORLD NEW WORLD

adding PUNCH to New World advertising

14th November 1951
"If you have two loaves, sell one and buy a lily"
By this the famed Li Po meant that man cannot live by bread alone. Neither can he live by Roast Beef, Potatoes, Yorkshire Pudding and Apricot Charlotte alone; nor by Roast Neck of Lamb, Potatoes, Green Peas, Apple Pie and Baked Custard * alone... But with the assistance of the Ministry of Food and a NEW WORLD 1840 Gas Cooker, he can have a good try. We can offer you no loaves, no lilies, no roast beef... and, no, not even any neck of lamb. We can and do offer the suggestion that you go quickly to your nearest Gas Showrooms and there ask to see these incomparable NEW WORLD 1840 Gas Cookers.
* From "Whole Dinner Menus", page 228 et seq of the Radiation Cookery Book, 40th Edition. Price 5/- sent at all Gas Showrooms.
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PRODUCT OF Radiation Ltd
...it's a for me!

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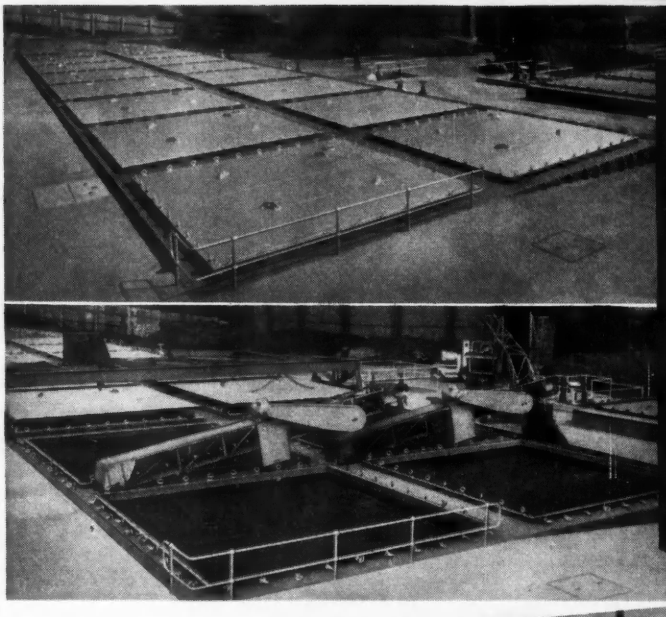

ENQUIRIES ARE INVITED FOR ALL TYPES OF PURIFIERS, CAST IRON, WELDED STEEL OR TOWER TYPE

TOP PHOTOGRAPH

Two new Purifiers 40 ft. × 40 ft. by 6 ft. deep at ground level, with an immediate repeat order for two further boxes of the same size for the Eastern Gas Board, Colchester. Original Purifiers also erected by us on right.

BOTTOM PHOTOGRAPH

View showing portable conveyors (also included in our contract) in position for unloading oxide from the boxes.

purifiers

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to the stage they had reached in considering general revision of tariffs, decided to defer an increase. The other nine revised their prices in an upward direction, the opportunity being taken in a few cases to reduce prices which were already abnormally high.

Main increases in the costs of materials and services were as shown in Table 6.

These increases were partly offset by increases authorised in the price of coke as follows: (1) From May 15, 1950, on account of increased costs of petrol, 5d. per ton for coke sold retail and varying amounts up to 3d. per ton for coke sold wholesale; (2) from June 12, 1950, on account of increased railway rates, varying amounts up to 3s. 6d. per ton; and (3) from February 12, 1951, because of an increase in the price of coal, 6s. 3d. per ton. The average increase in the cost of materials other than those specified was 10%, and prices were continuing to rise at the end of the year.

As an indication of the cost of constructional work now and before the war, examples, not specially selected, are quoted in Table 7.

TABLE 7.

	Cost 1936-37	Quoted prices 1951
2 mill. cu. ft. capacity 4-lift spiral holder in steel tank, without foundations	£28,740	£101,000
1 mill. cu. ft. capacity spiral holder in steel tank, without foundations ...	£23,000	£61,000
Four purifiers, 40 ft. × 30 ft. × 6 ft. ground level boxes with valves and connections but without foundations	£9,500	£28,000

Taking the country as a whole, the increase in the price of gas now compared with the price in 1938 is from 60% to 80%—an increase, for a commodity not subsidised, much below the general increase in prices. The gas consultative councils were consulted by the boards before any revision of charges was made operative.

Black Cookers Replaced

The number of appliances supplied to consumers during the year, particularly cookers, showed a marked increase, and more could have been disposed of had they been available. Particular attention was paid to the replacement of obsolete cookers. As examples, the North Thames Board replaced 60,000 black cookers by vitreous enamelled cookers; the Eastern Board replaced 32,000, and in its four London divisions alone the South Eastern Board scrapped nearly 20,000.

A market survey by the East Midlands Board in Sheffield, Nottingham, Leicester, Derby, and Northampton indicated that from 40% to 50% of the gas cookers were more than 20 years old. While many of them gave satisfactory service the survey suggested the extent of the immediate problem of the replacement of cookers in the interests both of the saving of gas, which means the saving of coal, and of the consumer's pocket. The East Midlands survey also proved that with proper maintenance gas water heaters satisfy a real need, particularly where they act as subsidiary equipment in pre-1914 houses which have inadequate or inefficient main water heating services. The North Thames Board conducted a market survey of water heating which disclosed, especially in old housing, a widespread need for simple water heating equipment at a low price. Research at Watson House was directed largely to that end, and a cheap bulk water heating, which can be attached to a cooker, was developed to give a hot water service at low capital, installation, and running costs. Sales of water heaters, fires, and refrigerators continued to be restricted by purchase tax, a matter on which the Gas Council has made representations to the Government.

Considerable main laying has been carried out to provide supplies to new towns and housing estates. Most housing authorities allow tenants freedom of choice in the means of cooking and ancillary heating, but there are still a few cases where this policy is not followed. In one large housing estate 86% of the tenants chose gas for cooking. Where mains to new estates have to be laid a long time in advance of occupation the boards are confronted with serious financial problems in that years must elapse before a remunerative return can be obtained for the capital spent. These problems are seen in their worst form in the Eastern area where the five new towns of Harlow, Hatfield, Hemel Hempstead, Stevenage, and Welwyn are in the early stages of development.

The gas industry employed 143,506 persons at the end of the year under review, compared with 140,611 at March 31, 1950. While for the industry as a whole the labour force remained steady in total, the turnover was high, particularly in the predominantly industrial districts. The West Midlands Board, with a total of 12,552 persons employed at March 31, 1951, reports the recruitment of 6,134 and a loss of 5,854 during the year. A high rate of turnover extends now even to office jobs where stability was previously the normal condition. The gas industry is not unique in this respect, and in present circumstances the competitive demands for labour are likely to increase, but this high rate of turnover inevitably affects production, particularly in the winter months.

The figures quoted emphasise the value of the measures the boards are taking for the welfare of their employees, and which may be expected to yield a cumulative return. They emphasise also the gratitude due to the many employees with long service in the industry to whom falls the task of guiding and encouraging the less experienced. The Council records that in addition to other honours conferred by the King, 14 employees received the B.E.M. in recognition of long and faithful service, and four received His Majesty's Commendation for gallantry.

Coke and By-Products

Total production of coke and breeze during the year was 11,847,000 tons of coke and 2,719,700 tons of breeze. Sales were 10,244,900 tons and 1,523,700 tons respectively, the remainder being used for the manufacture of water gas, steam raising, retort heating, and other purposes. The year was a difficult one in coke markets, stocks at gasworks falling from 1,100,000 tons in September to 400,000 tons at the end of December and to 146,000 at the end of March. Emergency measures were introduced by the Minister of Fuel and Power, the export of coke being stopped on January 1, and a system of priorities established to maintain full deliveries to essential users.

The closing paragraph of the Gas Council's report, which comprises 60 pages of review, 96 pages of financial and statistical tables, and 12 pages of diagrams and graphs, says it has not been an easy year. The boards had to meet increasing demands for gas with stocks of coal which were constantly the cause of great anxiety, and they had to see the dates on which they had hoped to complete sorely needed plant recede further and further into the future because of delays in the delivery of steel and other materials. At the same time steady improvement was made both in the efficiency of the manufacture of gas and in the standard of service given to consumers. While major economies must await the fulfilment of their long-term plans, the boards show a number of instances where substantial administrative economies have been made; and these, against a background of rising costs of materials and services such as transport, have all the greater value.

'Argonarc' Process Welding

On December 4 we were invited by the British Oxygen Co., Ltd., to the premiere of their sound and colour film 'The Argonarc Welding Process.' This film, which is in two reels, sets out to describe the reasons underlying the development and growth of the process.

In the first reel the part which flux plays in the welding of light alloys and other metals is critically examined and it is shown how, by the use of Argonarc welding, flux may be eliminated, so extending the scope of the designer. The operation of the Argonarc torch and its associated electrical equipment is explained and various forms of automatic and semi-automatic set-ups for welding are shown.

In the second reel various types of power supply to the arc are examined through the eye of the high speed camera and by means of animated diagrams. The film not only makes the understanding of complex phenomena possible but is unique in providing a comprehensive sequence of this kind in a colour film. The closing scenes portray practical applications of the theories explained in the earlier part of the picture.

Oil Prices.—As from today (December 12) the prices of fuel oil and Diesel and gas oil are to be raised in ports in the United Kingdom by about 12s. 6d. a ton.

Ascot Gas Water Heaters, Ltd., will shortly open a showroom and service centre in Sydney, Australia, to deal with the rising volume of orders from the Commonwealth. The centre will be managed by Mr. Pat Ryan, who has been Ascot's technical representative in Australia for the last 14 months.

CONSULTATIVE COUNCILS IN SESSION

Special Rates for Special Loads

Master Bakers Appeal to Southern Council

A MATTER of considerable importance to the industry as a whole was discussed at the meeting of the Southern Gas Consultative Council at Bournemouth on December 5 (under the chairmanship of Alderman J. W. Moore)—namely, can and should the industry offer special rates for special jobs?

The subject was raised by a deputation from the Berks County Master Bakers' and Confectioners' Association, headed by the Association's national director (Mr. L. F. Cadwallader), who put the case for a special tariff for the offpeak baking load. The deputation numbered about eight delegates, all practical bakers.

Opening the case, Mr. Cadwallader said the object of the deputation was to place before the Council the views of representatives of the baking industry in connection with the scale of charges which bakers were called upon to pay for their gas. It was generally realised that bakers as a whole were large users of gas, and it was felt that they should have some special treatment in regard to rates. There were a number of reasons why this should be so. In the first place, bread bakers were in a very difficult position inasmuch as the price of bread was controlled; the price of their main raw materials was also controlled, and a system of subsidy was in operation, worked by the Ministry of Food, which kept down the margin of profit to such a small figure that bread baking was becoming an uneconomic proposition. It was not possible to pass on increases in price to the consumer in the same way as other industries could.

Bread Baking Tariffs

Where a baker was able to obtain his fuel at a low cost he had a clear advantage over another who was compelled to pay a higher charge. In certain parts of the country, said Mr. Cadwallader, there were special bread baking block rates, and he named three area gas boards where such a tariff was available. The basis of this tariff was the local rate for the first 100 therms, after which there were progressive reductions for increased consumption. He felt that this principle was a sound one and should be extended to bakers in all parts of the country. It was generally recognised that the price of gas must vary in relation to local circumstances, but there was a principle involved whereby the baker merited special consideration. For example, when gas was used for baking it was used in large quantities, and once the service charges had been met it was clear that it did not cost so much per therm to supply gas in large quantities as it did in small quantities.

A further point was that a large proportion of the load was at night when other consumers were not using gas to the same extent. In many instances, before nationalisation, local gas undertakings found that it was an economical proposition to encourage bakers to use gas because they were large users and were able to reduce the costs of production. It was not a question of providing a special rate at the expense of other consumers.

The matter was of great importance to the baking industry at the present time because in many instances bakers had plant which had been in use for many years, and they had now reached the position of having to decide what type of oven to put in when replacement was due—solid fuel, gas, electricity, or oil—and in trying to plan ahead they must consider the economic aspect. Consequently, they were most anxious to have some guidance as to the future policy in the matter of gas charges—whether the trade would have a special rate and whether prices were likely to rise.

When the plant was originally put in bakers were in many cases getting their gas at a contract price, which on the accession of the Southern Gas Board was arbitrarily cancelled. Mr. Cadwallader said he was called upon to advise members on the installation of new plant, and he therefore needed some indication of where they were going in the future.

A group of members of the Southern Gas Consultative Council on the occasion of a recent visit to the Portsmouth gasworks.

He submitted that special consideration should be given to this problem of the price of gas for baking—whether the gas industry wanted the baking load or whether bakers would be better advised to use some other type of fuel.

Their association had originally taken up this question with the chairman of the Gas Council, but the reply they got was that the area boards were autonomous, and it was the responsibility of each to make a decision in the matter. They asked whether the Gas Council would be prepared to meet them as a body. This request was refused, and they were referred to the individual boards—which was the reason for the present deputation. Furthermore, the baking industry had for long been pressing the Ministry of Food to accept the principle of a differential price for bread in different parts of the country; but up to the present the Ministry had not agreed to this.

Members of the Consultative Council asked the deputation a number of questions. One was: 'Are not the retailers of food the most prosperous section of the community?' Mr. Cadwallader said he could not speak for food retailers as a whole, but this suggestion certainly did not apply to bakers. Asked what percentage of bakers in the area were members of the Association, the secretary replied: 'Practically 100%.' It was stated that several bakers had been forced to discontinue delivering bread as a result of the small margin of profit. For certain of their raw materials bakers had to pay more than the housewife—notably for sugar and a number of unrationed commodities.

One member of the deputation, representing the small baker, said that whereas his gas bill last March was £28, it had risen in July to £49.

The manager of the Reading Co-operative bakery, which uses 55,000 therms per annum, pointed out that the existing block rate stopped at 5,000 therms, which was no use to the large user. He argued that the steps should be continued. At the moment the price of gas had put the industry in such a difficult position that many bakers were scarcely paying their way and would probably be 'in the red' before very long. He was of the opinion that the block rate should be continued three or four steps further to make it an attractive proposition to the larger baker. His firm was contemplating the installation of more plant which would consume a large amount of gas. This proposition was entered into five years ago, but now they were advised not to install gas-

fired boilers because of their high consumption—and many other bakers were now wondering whether they had done right in putting in gas-fired ovens.

After the deputation had stated its case and withdrawn, the Secretary of the Council (Mr. C. King) was asked by the Chairman to read the relevant clause of the Gas Act, and members pointed out that the Act did not lay down that *no* preference should be given to any particular class of consumer, but that boards should not show *undue* preference to or discrimination against any person or class of persons.

A resolution to the effect that the Council should adhere to its previous decision on the matter of uniformity of tariffs was lost, and it was agreed that full information on the whole matter, together with details of the special tariffs for bakers in other areas, be obtained and that an emergency meeting be called in January which the Chairman of the Board be invited to attend.

In the course of the Council's other business further points on the subject of gas charges came up for discussion. A member referred to the dissatisfaction which had arisen in the Southampton area as a result of the discontinuance of discounts for prompt payment of accounts, and in this connection the Chairman pointed out that they were in order under the Gas Act in discontinuing discounts when prices were revised.

The proposed introduction at the beginning of the next financial year of progressive steps in the price charged for gas was also discussed. It appears that under the existing system there is a tendency when consumers approach the upper limit of one step for them to waste gas so as to get into the next scale. The introduction of additional steps would remove this anomaly. The Council did not want the new steps to increase the price of gas, and the proposals would be put before them as soon as they had been worked out. The Chairman pointed out that they must not assume that these proposals would reduce the price of gas. With the Board's wage bill increased by £110,000 per annum it would be extravagant optimism to anticipate any reduction in price. They must also take into account the probable increase in freight charges and in the cost of coal.

Standardisation of the price of gas appliances within the area was considered as a result of criticisms that some appliances were quoted inclusive of fixing and others not. The Board had decided that in future the net cost of the appliance should be quoted and that fixing should be a separate item which would be the subject of an estimate based on the work to be done.

The question of facilitating the payment of accounts in rural areas was deferred till the next ordinary meeting, which was fixed for March 5, 1952, at 2 p.m., at Reading.

BEEF, AGRICULTURAL EQUIPMENT—and GAS

GOOD DISPLAY at SMITHFIELD SHOW

IT was gratifying to see the gas industry again represented at another major agricultural event; and although this year's Smithfield Show and Agricultural Machinery Exhibition at Earls Court last week was shadowed, at any rate so far as the livestock entries were concerned, by the Ministry order that all animals must be slaughtered after the Show (in consequence of the serious outbreak of foot-and-mouth disease), there was a fine display in all sections.

The connection between gas and meat production is perhaps less obvious than that between gas and milk production, but since both go hand in hand on a very large number of farms there is clearly a place for the gas industry's exhibit at this Show just as at other leading agricultural events.

The Gas Council stand occupied an excellent position in the gallery and was laid out on attractive lines, with a varied selection of appliances of interest to both the farmer and his wife. Several of the appliances were 'live'—notably some water heaters discharging (appropriately enough) into milking buckets standing on wooden milking stools. Coke-fired apparatus was prominently featured, together with steam-raising plant, sterilising equipment, and pasteurisers.

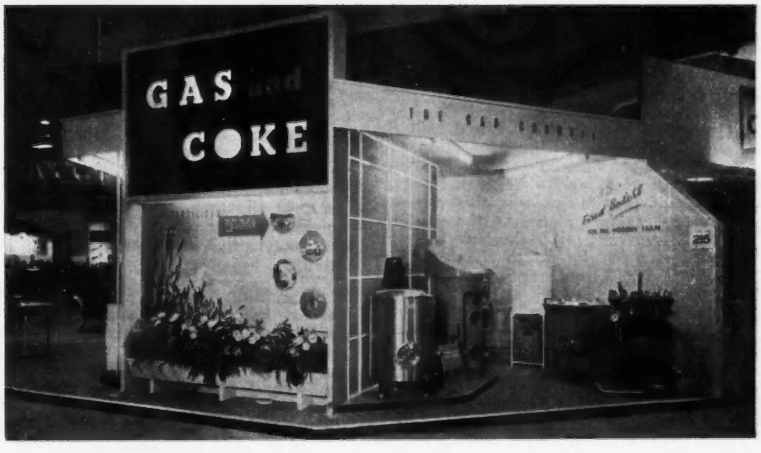
An interesting appliance which has appeared at several agricultural shows lately, and has attracted considerable attention, is the 'Millwall' bone digestor, which makes possible the recovery of valuable jelly, fat, and bone meal from bones and other scrap material on a scale not hitherto possible for the small user. It is, in effect, a large pressure cooker and is equally suitable for the cooking of meats, hams, offals, etc., while a similar model may be used for sterilising foods packed in cans. The bones are placed in galvanised wire mesh baskets inside the digestor and cooked by steam at pressures up to 35 lb. per sq. in. The liquor collects in the bottom and is drawn off by a drain cock after processing. The gas supply is automatically controlled to maintain the correct pressure.

In our review of the Gas Council's stand at the recent Dairy Show we commented upon the absence of emphasis on grass and grain drying and suggested the use of models to portray this important aspect of the industry's contribution to agriculture at exhibitions and shows where the display of full scale working models was impossible.

It was therefore with considerable pleasure that we found this suggestion carried into effect at the Smithfield Show. Two excellent models (though unfortunately not quite to the same scale) were set out—the I.C.I. drier and the Slade-Curran drier. Both are fired on the semi-producer principle and both are adaptable for grain drying. The I.C.I. Mark III drier is designed to produce 4 cwt. of dried grass per hour, or 2 tons of grain per hour. The Slade-Curran apparatus has a fuel consumption of 1 cwt. of coke per hour and dries a load of grass in three to five hours. It is of relatively low first cost, requires only one man to operate it, and is therefore particularly suited to the small and medium farm.

These models were well displayed on an open corner of the stand, so that visitors could get all round them and inspect every detail. Supporting literature on the subject of grass and grain drying by coke was placed nearby, and we understand that this section of the exhibit attracted a great deal of attention from farmers at the Show.

Though the Gas Council stand was only one of some 2,500 exhibits at this huge Show it very creditably represented an industry which has a big part to play in helping British agriculture.



IN PARLIAMENT IMPORTANT COMMITTEES NAMED

INFORMATION concerning the constitution and functions of two important committees was given in the Commons last week. On December 3 Mr. Geoffrey Lloyd, Minister of Fuel and Power, in reply to Mr. G. D. N. Nabarro (Kidderminster), said the National Fuel Policy Committee established to investigate wider aspects of national fuel and power policy was studying a great deal of technical information and he could not say when its final report could be expected.

Members' names and status were: Chairman: Viscount Ridley, C.B.E. (Chairman of the Northumberland County Council); Members: Lincoln Evans, C.B.E. (General Secretary, Iron and Steel Trades' Confederation); N. W. Gardiner (Technical Director, Huntley and Palmers, Ltd.); Sir Claude Gibb, C.B.E., F.R.S. (Chairman and Managing Director, C. A. Parsons & Co., Ltd.); Professor W. R. Hawthorne (Professor of Applied Thermodynamics, Cambridge University); Professor W. A. Lewis (Professor of Political Economy, Manchester University); Mrs. M. McIntosh (Tutor in Sociology, Bedford College, University of London; Member of London County Council); and Miss M. R. Schofield (Housing Manager, Stoke Newington Borough Council).

On the following day terms of reference and names of the Select Committee appointed 'to consider the present methods by which the House of Commons is informed of the affairs of the Nationalised Industries and to report what changes, having regard to the provisions laid down by Parliament in the relevant statutes, may be desirable in these methods' were approved. It will consist of the following members: Mr. A. H. Albu, Mr. R. Assheton, Mr. A. J. Champion, Mr. Ernest Davies, Viscount Hinchingbroke, Mr. H. N. Linstead, Mr. P. J. Noel-Baker, Sir Patrick Spens, Mr. C. N. Thornton-Kemsley, Sir Herbert Williams and Mr. Ronald Williams. The Committee will have power to send for persons, papers, and records, and to report from time to time.

South Eastern Building Licences

Sir HERBERT WILLIAMS asked the Minister of Fuel and Power on December 3 the total value of the licence granted to the South Eastern Gas Board in connection with any works of reconstruction at the offices at Park Lane, Croydon. Mr. Geoffrey Lloyd said the authorisations granted in connection with work at that office covered an estimated total cost of £37,707. Asked if he could make some enquiries why this expenditure was taking place, as the building seemed perfectly all right before it was taken over by the South Eastern Gas Board. Mr. Lloyd replied: 'I cannot make a comment on an authorisation given some time ago, but I can, of course, make some enquiries.'

Accounts of Nationalised Industries

In a written answer to Mr. G. Nicholson (Farnham, Surrey), who asked when it would be possible for him to announce the steps he intended to take to bring the accounts of nationalised industries and corporations within the scrutiny of the House, Mr. R. A. Butler, Chancellor of the Exchequer, said the present arrangements provided that the accounts of the nationalised industries were presented to Parliament, and it was open to the Public Accounts Committee to examine them. Before making proposals for further measures to bring those accounts within the scrutiny of the House, he would prefer to wait until the House had had an opportunity of examining the report of the Select Committee considering the methods by which the House of Commons was informed of the affairs of the nationalised industries, and what changes, having regard to the provisions laid down by Parliament in the relevant statutes, might be desirable in those methods.

Fireguards Bill

Private Members' Bills presented on December 5 included the Heating Appliances (Fireguards) Bill to prohibit the sale of certain heating appliances without an effective fireguard; and for purposes connected therewith.' The Bill was presented by Mr. Bullard; supported by Mr. Ronald Bell, Mr. Blenkinsop, Mr. Hastings, Mrs. Hill, Mr. Marquand, Mr. Nabarro, Mr. Oliver, Mr. Ian L. Orr-Ewing, Mr. Proctor, Commander Scott-Miller and Mr. West.

The Bill was read the first time; to be read a second time on March 14.

Proposed Extensions at Oxford

THE Southern Gas Board announced last Friday in a memorandum to the Oxford City and County Councils that, contrary to an agreement reached a year ago to erect a new gasworks at Cowley, it proposed to proceed with extensions to the existing works. Proposals for extensions were the subject of public enquiry three years ago, and after certain sanctions had been obtained an appeal to the House of Lords resulted in the scheme being dropped. The Board afterwards proposed to lay a main from Reading to Oxford to supply additional gas and to erect a water gas plant on the present site pending the building of a gasworks at Cowley. It is now proposed that only a new gasholder shall be erected on the Cowley site, and that the rest of the plant shall be built at the present works.

The Board's memorandum states: 'If the proposals are not adopted without delay the Board cannot hold itself responsible for the future of gas supplies in Oxford.'

Colonel H. C. Smith, Deputy Chairman of the Gas Council, referred to the matter at the Press conference on the Gas Council report in London on Monday. He said that by building the new plant on the old site instead of at Cowley the Board would save 1,450 tons of steel and nearly £500,000 in labour. The overall saving in capital expenditure would represent a difference of 2d. per therm in the price of all gas sold in the Oxford area of supply.

It was stated yesterday (Tuesday) that the university would support the Oxford Preservation Trust in any action it took to insist on the carrying out of the agreement to erect the new works at Cowley.

Dearer Gas in Eastern Area

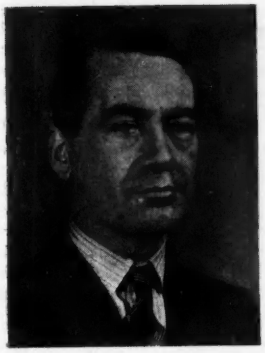
Statutory notice was given by the Eastern Gas Board on December 8 of an increase in the flat rate prices of gas throughout its area with effect from the next meter readings. The amount of the increase varies from ½d. to 2d. per therm or 3d. to 8d. per 1,000 cu.ft.

With the exception of seven undertakings in the Norwich division, where the prices are 24.5d. per therm in two towns and 23d. in five others, the highest price in the area is now 22.5d. Berkhampsted, in the Watford division, has the lowest price in the area at 16.5d. per therm.

In addition to the variations in the flat rate prices, a slight amendment has been made to the discounts allowed to non-domestic consumers under the all-purposes block rate, and the price under the second block of the bread baking tariff has been increased to 14.5d. per therm, or 6s. per 1,000 cu.ft.

The Institution of Gas Engineers has published in 'grey book' form Communication No. 384/181, being the symposium of short papers submitted by the British Junior Gas Association's Joint Council presented and discussed at the annual general meeting last May. Copies are available at 2s. 6d. each, post free.

Institute of Fuel.—I.C.I., Ltd., have been engaged on development work on the pilot plant stage for some years on a process for water gas production in a fluidised bed. A paper entitled 'Gasification by the Moving Burden Technique' is to be read to the Institute of Fuel by J. W. R. Rayner, of I.C.I., on Tuesday next, December 18, at the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, at 5.30 p.m. Tea will be available at 5 p.m. The paper discusses the technique used and deals extensively with factors relating to output (which mainly affects the operating cost). The meeting is open to all. A few advance copies are available, price 3s. 6d., to non-members of the Institute.



COAL TRAVEL IN CONTINUOUS VERTICAL RETORTS*

Use of Radio-active Tallies

By C. H. LEWIS, M.Sc., M.Inst.Gas E.,
North Thames Gas Board.

IF a suitable radioactive substance be introduced into a continuous vertical retort, it is theoretically possible to determine the position of the source of radiation from observations made with suitable radiation measuring equipment external to the retort. The rate and path of descent of the source can be plotted from these observations; discharge of the source from the bottom of the retort is easily detected, and its subsequent location in the discharged coke is extremely simple. In practice, however, there are many factors requiring consideration.

The Atomic Energy Research Establishment at Harwell was consulted as to the practicability of the proposed use of a radioactive tally, and as to the most suitable source. The pile-produced radio-isotope cobalt 60 was selected for the following reasons:

(1) It is readily available in a wide range of activity.
(2) The comparatively long half-life of 5.3 years is an advantage, since one source may be used repeatedly over long periods.
(3) The principal radiation is in the form of highly penetrating gamma rays.
(4) The solid form of the source, coupled with its high melting-point (1,480°C.) and low volatility, avoids most of the possibility of contaminating either the coke, the gas, or the retort house with radioactive substances.

The sole risk of radioactive contamination arises from the possibility of corrosion or abrasion of the source, which might lead to small fragments of radioactive cobalt or its compounds (such as the sulphide) becoming detached and disseminated throughout a considerable quantity of coke. This can be prevented by enclosing the source in a suitable container. The only risk to personnel involved in the work is that associated with gamma radiation, which can be minimised by proper precautions.

The source is therefore enclosed in a heat-resisting steel container of cylindrical form, 1¼ in. long and 1⅜ dia., with walls $\frac{3}{16}$ in. thick and closed with a screwed plug. This container has proved entirely satisfactory, and has survived over 20 passages through working retorts without sign of deterioration.

To secure the maximum range of measurement, the activity of the source must be such that when the radioactive tally is adjacent to the wall of the retort, and as close to the Geiger counter used for measurement as the design of the retort permits, the counter is operating near the upper limit of its working range. An activity of 5 millicuries has been found convenient with the equipment used, and gives a maximum of about 1,700 counts per sec. when in use.

Radiation Measuring Equipment

The essential features of the measuring equipment are:—

(1) A Geiger counter that produces pulses at a rate dependent on the incident radiation.
(2) Apparatus for recording the pulses from the counter.

To avoid the use of dangerously powerful sources, and to obtain a high degree of precision, the Geiger counter must be as close to the retort wall as possible. If experiments be confined to the end retorts of an installation, and a sufficiently powerful source be used, it is possible to locate the tally by means of a counter adjacent to the end wall of the retort bench. The thickness of the end wall implies that the source must always be separated from the counter by some 4 or 5 ft. of solid material, and a moderately small displacement of the source will subtend only a small angle at the counter, while the activity of the source will be such as to require heavy screening when out of the retort. This difficulty can be partly overcome by reducing the thickness of the end wall to about 1 ft., but in order to avoid unduly weakening the structure the number of points at which this can be done, and at which measurements can be made, is limited. In both cases, therefore, the attainable accuracy is low, and the limitation of experiments to end retorts is undesirable.

A method of employing the Geiger counter in the combustion chamber has therefore been developed. The counter used operates only in the temperature range −50°C. to +50°C., and the connecting cable may fail at temperatures exceeding 70°C. It is therefore necessary to enclose the counter and connecting cable in a water-cooled probe. To minimise the heat abstraction from the combustion chamber the dimensions of the probe must be kept as small as possible, so that the Geiger tubes must be of small size. This results in two important advantages, in that the background counting rate is correspondingly low, and greater precision of location is obtainable because the angle subtended by the counter for any given position of the source is smaller. The G.4.H. counter, manufactured by 20th Century Electronics, has been found suitable for this work. This type of counter has the further advantage of producing unusually large pulses, which, after suffering attenuation and distortion in the connecting cable, are still capable of operating the counting apparatus. A probe or head amplifier is thus not required.

The counting rate of the Geiger tube is indicated on a ratemeter based on the radiation monitor, type 1021B developed at the Atomic Energy Research Establishment†. The design has been modified to permit of operation from dry batteries and a 6 V motor-car accumulator. The accuracy of the ratemeter when operating on uniformly spaced pulses is about ±1%. The pulses from the Geiger counter are, of course, received at a random rate, the fluctuations in which are damped by an 'averaging circuit' with a time-constant of 7 sec.

An electronic scaler is capable of giving more accurate results than a ratemeter; the ratemeter is preferred for this work because a direct indication of the counting rate is given on a meter. The random fluctuations, which are more pronounced at the lower counting rates, imply a limitation in the accuracy of the technique when measurement is carried out at extreme range, and a scaler will probably be used in conjunction with the ratemeter in future work.

Battery operation is preferred because suitable A.C. supplies are not available in all of the Board's retort houses.

* Abstract of a paper (I.G.E. Publication No. 394) given to the Institution of Gas Engineers, November, 1951.

† Kandiah, K., and Deighton, M. O. 'A Transportable Radiation Monitor.' *J. Sci. Instruments*, 1950, 27, 219.

A larger Geiger counter, mounted on a tubular handle, is used, either with the accurate ratemeter or with a small prospecting-type instrument, for monitoring the coke discharged from the retorts and for locating the source after discharge.

A steel tube of sufficient internal diameter for easy passage of the tally, and fitted with a loosely sliding plunger, is inserted through one of the top rodding holes and pressed down a known distance into the coal. The distance of the bottom of the tube from the top of the rodding hole is measured, the plunger is removed, and the source is dropped down the tube. The plunger is again inserted to ensure that the tally is at the bottom of the tube, and the tube and plunger are withdrawn. In this way the tally commences its journey from a known position and is completely surrounded by coal.

In the case of a retort with horizontal combustion chambers and flues, a water-cooled probe is then inserted in each of the two top flues, one on each side of the retort, taking care that the heads of the probes inserted in each of the two flues are in contact with the wall of the retort being studied. The probes are then moved in and out of the flue to locate the position at which the maximum counting rate is recorded. The distance of the head of the probe from the front wall of the setting is measured, and this gives the position of the tally along the major axis of the retort, since the maximum counting rate is recorded when the probe head lies in the same vertical plane, normal to the retort wall, as the tally.

By displacing the probe and repeating this exploration, the results are generally found to be repeatable within ± 1 in., approximately, and in most cases both probes give the same result for major-axis position.

Observations of the counting rate of both probes are made at 15 min. intervals, the major-axis distance being checked at each observation. As the tally descends, the counting rate on each probe increases until the tally lies in the same horizontal plane as the probe heads, when the counting rate reaches a maximum and begins to decrease. The maximum rate and time are both recorded, and at this instant the location of the tally is fairly precisely defined in two planes, although the position on the minor axis is not directly determinable.

In general, the tally will be closer to one probe than the other, and the nearer probe will record a higher counting rate. The position of the tally on the minor axis can be computed from the relative counting rates if the absorption coefficients of the various solid media are known.

When the maximum rate has been recorded, the nearer probe is transferred to the next lower flue, readings are taken with both probes and the second probe is then moved to the same level. In this way, shortly after the tally passes the initial level of the probes, readings of counting rate are made from four different positions, two of which are level with the source and two below it. Observations are continued from the second combustion chamber in the same way, the probes being moved each time the tally reaches the level of the probes as indicated by the maximum counting rate.

From the foregoing, it will be appreciated that immediate indication of distance along the major axis is available without calculation, and that the time at which the tally passes certain fixed points is similarly directly determined. The position of the tally on the minor axis, together with supplementary data on the rate of descent, can only be obtained by computation from the observed results, and although many of the observations consist of two readings only, which are the minimum for the position of the tally to be defined in two planes, four readings are available at the time when the position of the tally is most accurately defined; the existence of a double set of readings provides facilities for checking the method of computation.

All coke discharged from the retort is monitored for radioactivity before it is allowed to leave the retort house. In the event of any active coke being encountered due to breakage of the source container, it would be necessary to segregate such coke to prevent injury to the health of persons, who might come into contact with it. No such activity of the coke has been encountered.

When the tally is known to be well below the lowest point from which observations are possible, the probes are withdrawn, and the coke box is monitored in order to determine the time at which the tally passes over the extractor. This is defined as the time of discharge, and is determinable with great accuracy.

The coke box is immediately discharged to the conveyor and the latter is stopped with the coke in it. The monitor is then used to locate the tally in the coke, and, when the tally is approximately located, coke is removed with a shovel from the area indicated by the monitor until the tally is found and transferred to its lead storage container. Location of the tally in the discharged coke takes a few minutes only. The coke is again monitored for radioactivity when the source has been removed.

Using the 5 millicurie source described, no dangerous level of radiation is encountered outside the retort structure while the tally is in the retort.

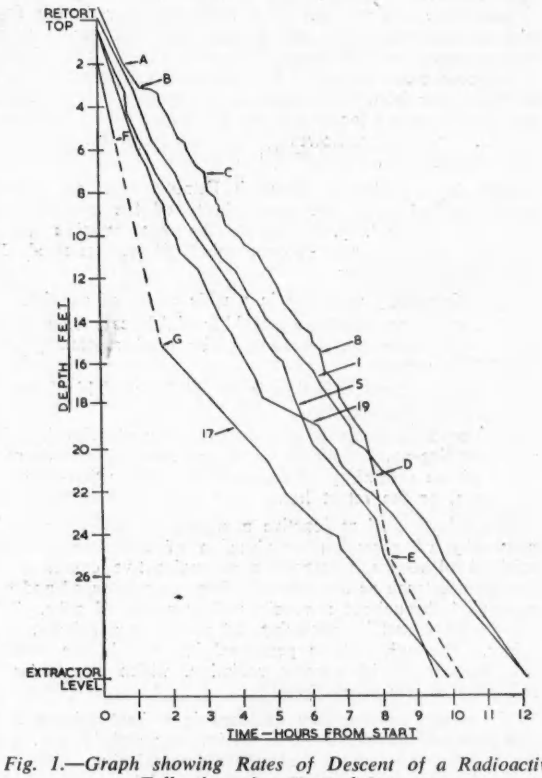


Fig. 1.—Graph showing Rates of Descent of a Radioactive Tally through a Vertical Retort.

The only time that personnel are exposed to harmful radiation is during the few minutes required to transfer the tally from its storage container to the retort, and to recover the tally at the end of the experiment. The tolerance radiation dose is not exceeded if the source is not approached within 2 ft. The source is, of course, handled only with tongs. Film badges are worn by the staff engaged on the work, and as a precautionary measure blood counts are carried out periodically.

Results of Observations

From the results of each experiment, three diagrams may be prepared, as follows:—

(1) *Rate of descent.*—This is plotted from the direct observation of the time at which the source passes the various combustion chambers, with additional data derived from the position diagrams.

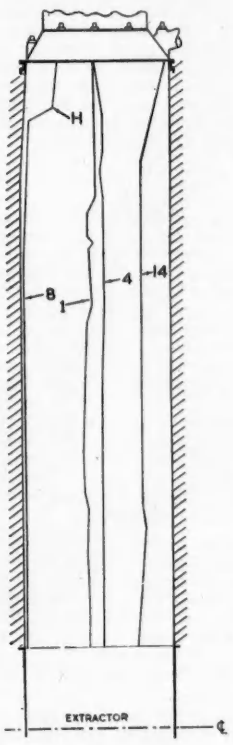
(2) *Path of travel in a vertical plane parallel to the major axis.*—This is plotted from direct observation of the major-axis position as determined by exploration with the probe.

(3) *Path of travel in a vertical plane parallel to the minor axis.*—This is plotted from the position diagrams as described above.

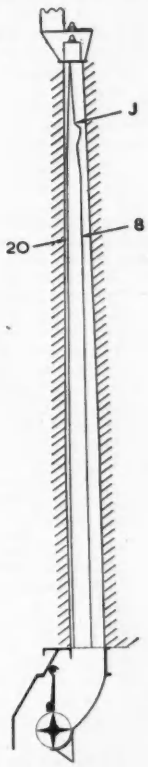
A series of such diagrams, representing some of the results of experiments carried out in one installation of lambently heated retorts, is shown in Figs. 1, 2 and 3.

In the case of retorts with vertical combustion chambers, the height of the source may be determined at any time by direct exploration, while the position in the horizontal plane is determined from position-line diagrams drawn to represent a horizontal cross-section.

Only one radioactive tally can be employed in any retort at one time. The use of more than one tally would result in counting rates depending on the relative positions of the various



MAJOR AXIS.
Fig. 2.



MINOR AXIS.
Fig. 3.

Diagrams showing Paths of Travel of a Radioactive Tally as Traced through a Vertical Retort.

tallies, and even approximate location of the tallies in the retort would be impossible. It is, therefore, necessary to carry out a number of experiments in any installation in order to obtain an overall picture of the mode of travel of the charge.

Some of the results obtained by the use of the radioactive tally in a lambently heated rectangular retort are shown in Figs. 1, 2 and 3. It is not intended to discuss the implication of these results; it would be unwise to attempt to draw any conclusions from an isolated series of experiments in which only one type of coal was carbonised in a single installation. These results are, therefore, presented solely with a view to indicating the scope of the method, and have been selected as indicating abnormalities rather than the normal mode of coal travel in this installation.

Fig. 1 shows the rate of descent of the tally in five experiments, of which only one (No. 1) may be regarded as normal. This is characterised by a fairly smooth descent with a total time of travel of 12.1 hours, and is representative of a number of similar results. Experiment No. 5 commenced in much the same way as No. 1, but the rate of descent increased at a depth of about 16 ft., so that the total time of travel was reduced to about 9.6 hours. This may be compared with No. 19, in which the tally proceeded rapidly to a depth of some 18 ft., and then slowed down so that the time of travel was normal at 12.1 hours.

In experiment No. 17, the tally was inserted in the rodding-hole on the offtake side of the retort, and, after reaching a depth of about 7 ft., dropped so rapidly that contact was lost, and by the time the tally was again located, 1 hour later, it had reached a depth of 15 ft. This portion of the descent curve is shown dotted, between the points marked F and G. The whole of the vertical path was in virtual contact with the end wall of the retort on the offtake side, and it seems probable that the charge was not in contact with the end wall, leaving a void through which the tally fell.

Experiment No. 8 was, perhaps, the most interesting. The tally travelled normally to a depth of about 2 ft., and was then disturbed during the normal rodding operations. This had little effect on the rate of descent, as shown at A, but displaced the tally about 12 in. on the major axis. After reaching a depth of 3 ft., the tally remained at virtually the same level for about ½ hour, as shown at B, and then resumed normal travel to a depth of 7 ft., where, at the point marked C, there was a sudden short drop. Up to this point, the coal consumption of the retort averaged 2.1 ft. per hour, as measured by the coal indicator, but when C was reached the consumption increased to 3 ft. per hour for a short period, ultimately reverting to an average of 2.75 ft. per hour. At point D (21 ft. depth), the tally dropped sharply, and had reached a depth of 25 ft. (point E) before contact was resumed, 25 min. later. This portion of the curve is shown by a dotted line.

Experiment No. 8 is also recorded in Figs. 2 and 3. In Fig. 2, the displacement of the tally on the major axis when struck by the rod is clearly shown at H, while it is also of interest to observe that there was some displacement on the minor axis at the point J, corresponding to the hold-up shown in the rate-of-descent curve. It will be noted that the hold-up shown at B in Fig. 1, and the drops shown at C and D, all occurred while the tally was substantially at the non-offtake end of the major axis.

Fig. 2 shows three further examples of irregular movement on the major axis, while a second example of displacement on the minor axis is shown in Fig. 3 by experiment No. 20.

During all these experiments, screened coals with a B.S. Swelling Number of 1½ to 6 were being carbonised, so that major irregularities of travel were not to be expected. The retort had been at work for 220 days since reconstruction of the silica belt and top firebrick zone.

It is hoped that further experiments, involving other types of coal and other designs of retort, will be carried out in due course, and that useful information on the travel of strongly swelling coals in continuous vertical retorts will be obtained.

DISCUSSION

Mr. H. Kerr remarked that for many years the North Thames Gas Board and the former Gas Light and Coke Company had studied the travel of coal through continuous vertical retorts, and the work carried out by Haffner and Weston was well known. These investigators used the technique of quenching working retort installations and valuable and interesting information was obtained. However, with that technique it was only practicable to carry out the experiments in old retorts due for dismantling. It was, therefore, possible to argue that the results and the observations made might not be representative of the more normal working conditions.

This argument, however, could not be used in connection with the methods adopted by Mr. Lewis. It was obvious

from the details given in the paper that an entirely new line of approach had been made available to the gas industry, and it was conceivable that the same principle might be used in other spheres of fuel research in the future.

It was well known that the medical profession used certain radioactive isotopes for investigating some of the functions of the human body. Broadly speaking, the work described by Mr. Lewis was somewhat analogous, and the new technique should enable them to follow the travel of the charge through a continuous vertical retort. What was perhaps more important was that the investigation could be carried out at any time throughout the working life of the retorts.

'No Mean Accomplishment'

The author described the essential parts of the equipment, the method of operation, and the errors involved in locating the tally. At the end of the paper, results were given of some of the tests carried out. No mention was made, however, of the care and thought which must have been given to the design and construction of the water cooled probe. He was sure that Mr. Lewis and his colleagues deserved to be congratulated on this achievement, as it was no mean accomplishment to have produced a piece of equipment which ensured that a delicate Geiger counter would operate successfully in surrounding temperatures of approximately 1,360°C., withstand a water jacket pressure of 150 lb. per sq. in., be small enough in cross-section to enter the standard combustion flue observation and control points, and yet be easily handled under retort house conditions. It was also obvious that the final interpretation of the data obtained, which gave an error of not more than two inches in the vertical path of travel of the radioactive tally, was the result of a very careful study of the chemical, physical, and mathematical factors involved.

A true knowledge of the manner in which coal travelled through a continuous vertical retort was of major importance to the designer as well as to the gas engineer. The ideal aimed at was the attainment of the smooth travel of the charge to obtain the maximum therms per ton, a controllable calorific value and gas output and easy working conditions for the operatives.

The graphs in Fig. 1 showed the rates of descent of a radioactive tally through a vertical retort. It would be noticed that, apart from the different contours of the curves, there was a marked difference in the 'end times' when the tally reached the coke extractor. The maximum difference shown was 2½ hours. It would be interesting to know whether the depicted curves were from experiments which were all carried out in the same retort, or whether, as there were retorts with different tapers at the works, more than one shape of retort was used. If all the experiments illustrated were carried out in the same retort, and assuming the operating conditions were constant, then it would seem that factors outside the retort structure affected the travel conditions.

It was well known that the type of coal carbonised materially affected the coal throughput in a given plant. For example, an installation of continuous vertical retorts when producing gas at a given calorific value would carbonise 24% more coal in the form of Scottish nuts than when dealing with the same grade of Durham coals.

Influence of Coal Size

In addition to the type of coal, the actual grade or size of the coal carbonised played an important part. An increased coal throughput of about 12% could be expected when carbonising nut coal as compared with that obtained when using run-of-mine coal of the same type. It was therefore possible to envisage a change in coal throughput of approximately 40% should the quality and grading of the coal change to the maximum extent mentioned. This meant, in effect, that whereas when using Durham run-of-mine coal the tally would take 12 hours to pass through the retort, when making gas of the same calorific value with Scottish nuts the tally could be expected to complete its journey through the same sized retort in about 8½ hours.

The foregoing figures illustrated extreme conditions, and although these would not normally be expected to occur on any works, it was quite usual for most gasworks to have to deal with very different qualities and grades of coal as a daily routine. The significance of these changes could not be overlooked, because when they occurred the coal throughput or travel automatically tended to adjust itself in the retort.

Screened coals, having a B.S. swelling number varying from 1½ to 6 were carbonised throughout the investigation and it would be interesting to know which types of coal were used. Irregularities of travel should normally not be noticed with such coals, but he would admit that the foregoing swelling numbers might be very significant when using radioactive tallies, because of the accuracy of measurement. The swelling numbers quoted indicated the coals had very different characteristics. Assuming they were from the South Yorkshire coalfields the lower figure of 1½ represented a very low swelling coal, whereas the higher figure of 6 could be that of a coking coal.

It was interesting to note that the investigators used the coal indicators as a measure of the coal input. This equipment was normally used only to give a rough guide to the working of the retorts, and while the data obtained during the tests were undoubtedly accurately measured, it was suggested that the measurement of coal input should be correlated to the coke output of the retort. Information on the actual revolutions of the coke extractor and/or the weight of coke discharged each period might be enlightening. These points were mentioned because many years ago a test was carried out for the Institution of Gas Engineers at Uddingston to see if it was possible to obtain complete gasification in a continuous vertical retort. Although the retort extractor was completely stopped, the retort still continued to take some coal after 18 days of non-extraction. It would seem, therefore, that differences in coal input could occur in the retort, particularly over short periods of time, and these might not indicate the conditions lower down the retort.

Stimulating Work

Dr. A. E. Haffner (North Thames) said that external indications of gross irregularities in travel in continuous vertical retorts were given by the failure of coal to enter the retort, the failure of coke to be extracted, and the obvious irregular drop in the charges. More refined and detailed studies of irregularities in travel had been given, made through the quenched retort experiments. Not only was there studied the structure of the charge, but by surveying the positions of several tallies embedded in the charge the relative movements of the several portions of the charge were deduced. Such quenching experiments had necessarily been limited to retorts due for replacement and, therefore, in poor condition, and of a 20-year-old design. The information gained, although scarcely more than confirming conclusions reached by other routes, had apparently been stimulating to further thought. These were almost the words Weston had written just before his death in order to contribute to this discussion.

Weston had been very prominent in applying his high skill and painstaking approach to the quenched retort experiments, but in the meantime had become responsible for the Bow Common station. It was therefore appropriate that the radioactive tally experiments should first be carried out at that station. He was sure that Mr. Lewis would be the first to acknowledge that the goodwill and experienced advice of Weston had aided and encouraged the smooth progress of this difficult work.

With insatiable curiosity and with the most modern of resources, Mr. Lewis had developed a technique for detecting the invisible and the untouchable. Mr. Lewis modestly referred to the paper as a description of a technique, and only to illustrate the scope of the method did he quote some results. They must share his restrained approach, and not impatiently expect to be able to redesign their retorts overnight so that coal travel was smooth and manual labour entirely eliminated.

He had been alert to see the possibility of applications of radio-active tracers which had been so successful in physiology, biochemistry, and studies of corrosion, and he (the speaker) understood that an oil company used these tracers to indicate the boundary between two different sorts of oil moving in the same pipeline. Although simply described, the experiments had required efficient organisation of vigilant and resourceful observers, and the analysis of results had called for extreme patience and tenacity. It had been an achievement to be able to determine a position of a tally within 2 in. in space and 3 in. in time.

Notable Advance in Technique

The technique was a notable advance on previous possibilities, but it was an unfortunate limitation that only one tally could be in the retort at the same time. It therefore could give no information about the relative movements of different parts

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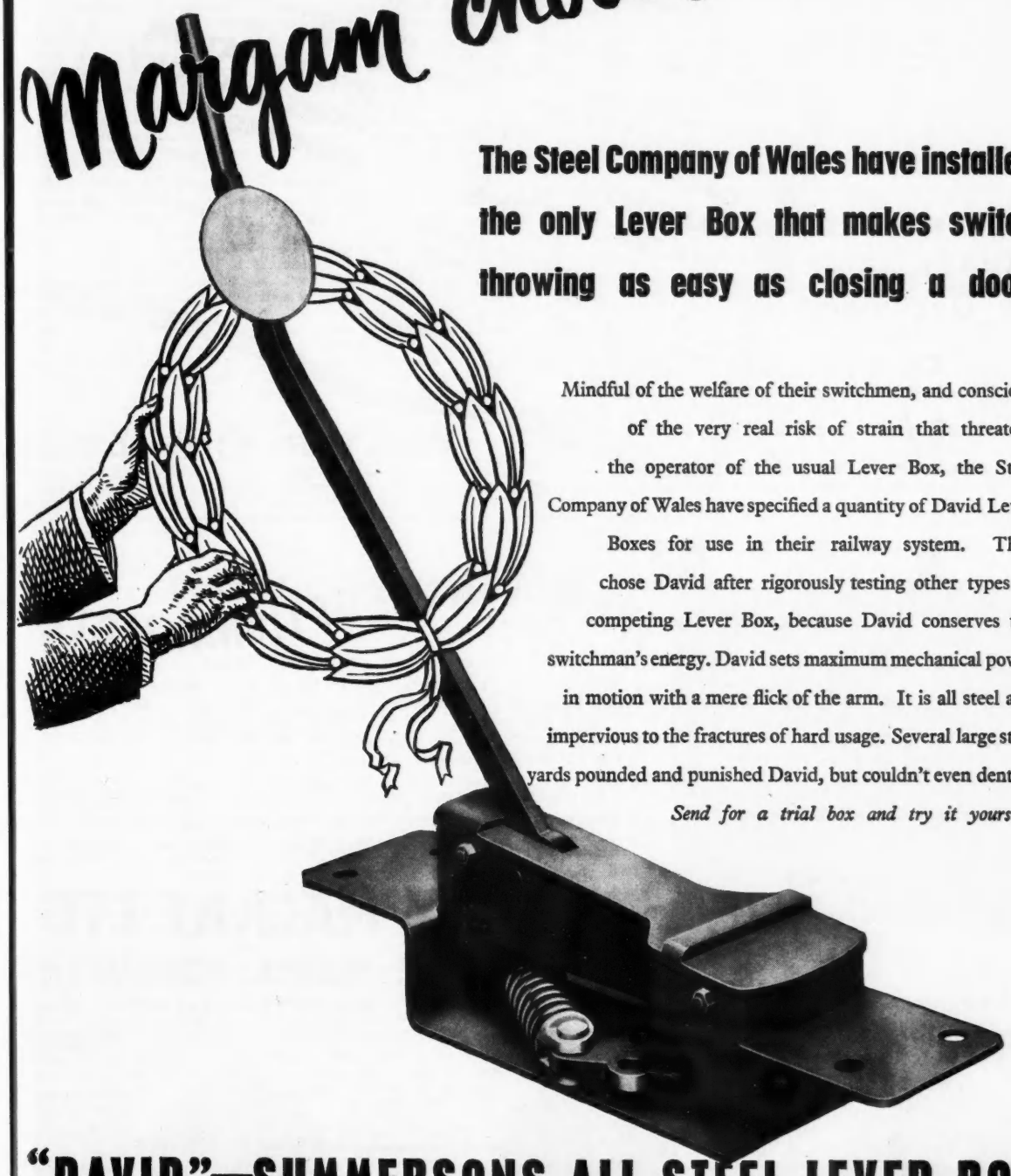

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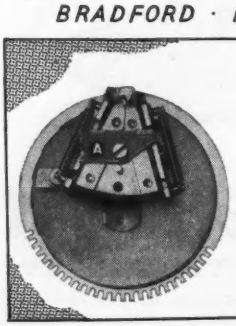


Fig. 1, on left, shows the back of the range-plate adjusted for optional coin. The swinging plate 'A' defies any attempt to insert a coin when one is already in the other slot.

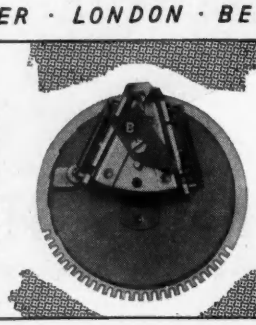


Fig. 2, on left, shows the plate positioned to admit sixpences only. To make this adjustment, loosen screw 'B' and tighten it again with the plate in the new position.

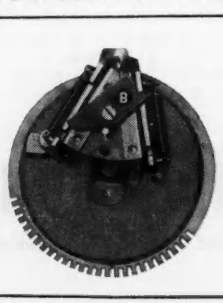


Fig. 3, on left, shows the plate positioned for shillings only. To make this adjustment, remove screw 'B', reverse the plate as shown and replace the screw.

of the charges. Not until 10 to 12 hours later was it possible to introduce another tally in another part of the retort, and, by that time, there was an entirely new charge of coal. The average of several successive determinations could not give the same information as the same number of simultaneous determinations. Perhaps Mr. Lewis had information about radio-active materials emitting other than gamma radiation, and which could be separately detected.

These first determinations had been carried out with an easy coal travelling through a recently reconstructed retort. The retorts were lambently heated so that the probes could be inserted through a number of horizontal openings. The next stage of the investigation would be on the Fulham 103-in. downwardly heated retorts carbonising Durham run-of-mine coal. The heating flues, being vertical, could only be probed from above, and consequently to gain headroom 20 ft. long 6-in. pipes had had to be welded into coal bunkers, to enable the probe with its trailing water connections to be inserted from above the coal bunkers. The achievement would be even more heroic and the results under the more difficult carbonising conditions would be even more interesting. The present data would also gain in value by having new information for comparison.

So much for the inside of the retort. There was much to be learnt about the path of heating gases in combustion flues, recuperators, and regenerators. Perhaps Mr. Lewis could tell them if a gaseous radio-active substance could be safely injected into a heating system and its route followed by a Geiger counter. Could, for instance, the degree of recirculation in a horizontal retort heating system be determined by introducing a shot of Radon, and measuring the rate of decay of radiation in the waste gases? Could a similar technique be used for purging operations?

Although many more questions would be raised about applications of this modern technique, for the moment they were concerned with this example which had been fraught with great physical difficulties. A technique had been most successfully established, and their state of knowledge would be extended by its use in similar investigations with different coals and different designs of retorts. Such data could not but be helpful in future design.

Mr. J Putman (Atomic Energy Research Station, Harwell) remarked that already radio-isotope techniques were beginning to be used in increasing numbers in various industries, but he believed that Mr. Lewis's investigations were the first in the coke and gas industry. He would like to ask a question about the validity of using a small and relatively smooth-sided tally to measure the movement of coal, through various dimensions and shapes and degrees of roughness in a retort. Could Mr. Lewis give them information about the bulk density of the tally and how it compared with the density of the coke or coal in the retort? Could he say whether he thought it would be an improvement to the accuracy of the method if the tally could either be embedded into a piece of coal fed to the retort or be enclosed in some artificial substance which very closely approached the average shape and density of the coal in the retort?

Mr. K. Francombe (Whessoe, Ltd.) commented that Mr. Lewis was aware of the new tools which radio-active isotopes were providing, resulting from the work of the Harwell scientists engaged on nuclear fission research. He also realised the need for determining the mode of travel of coal through vertical retorts by non-destructive tests. Just as radio-active iodine compounds were introduced into the body, so that their passage to the thyroid gland, and their rate of absorption thereby, might be measured, so had Mr. Lewis introduced his cobalt isotope into the coal passing through a vertical retort in order to determine its mode of travel.

Mr. Lewis, in a brief reply, commented on a remark made by Dr. Haffner in regard to the possible use of Radone or other radio-active substance in the measurement of the degree of re-circulation in a retort system. That would very probably be a fitting use for such a substance, and he thought the technique had already been developed by E. W. Boyce, of the Iron and Steel Research Association. Much had been said in tribute to the effort which had gone into the work described. He would like to make it clear that many people had been involved in it, and they had borne the heat and burden of the work in the retort house and the tribulations of the subsequent computation of the results.

PRODUCER GAS FOR PEAK LOADS

By D. J. WARD, M.Inst.Gas E.,

Assistant Engineer, Windsor Street Gasworks, West Midlands Gas Board.

In this paper given to the Midland Junior Gas Association the author explains how, during the past three winters, the make of gas in Birmingham has, by using producer gas as diluent, been increased sufficiently to satisfy demands.

DURING and since the war, gas outputs generally have been such that it has become increasingly difficult to meet demands. Regarding the position in Birmingham, the schedule of repairs and replacement of retort settings had been fairly closely adhered to throughout the difficult war period, and it was thought that with the end of hostilities the demand for gas might not show a further increase for a few years, thus giving a breathing space in which to install new carbonising units to restore the proportion of base to peak load plant. This should be roughly 85:15, taking the heavy winter outputs, from December to mid-March, as a basis for estimation. The lowest outputs are experienced from the end of May to early September, with intermediate outputs in periods mid-March to end of May, and early September to the end of November. As major repairs occupy anything from 6 to 8½ months, it is obvious that there is an overlap of about three months before and after the period of lowest output, when all work is not available and when the estimation of output is extremely difficult. It is during these spring and autumn periods when peak load plant has sometimes to be worked at the maximum to replace base load coal gas plant which is down for repair.

In the case of the Windsor Street works, with which this paper specifically deals, whereas in 1938 the carburetted water gas available for peak load purposes in the winter months was in the region of 10% to 15% of the total possible make, by 1946 this figure had shrunk to 0% to 3%. Thus the unenviable position had to be faced of trying to get a quart out of a pint pot, and the need was most urgent to find some means by which the total make from the works could be increased, coupled with the maintenance of a steady town C.V. of 450 B.Th.U.

Choice of Producer Gas as Diluent

There were a few alternatives, each with its attendant difficulties. The obvious one was materially to increase throughputs, say up to 10% above nominal, one limiting factor to this being the capacities of the coke chambers. Another factor depended on the available heat for carbonisation of the coal, tied up with the production of a well burnt off coke. Again, if high throughputs were to be properly carbonised, no heat could be spared from the heating flues to assist in the formation of the extra water gas required from steaming the charge to obtain the declared C.V. Thus, the higher throughputs automatically meant a higher C.V., and if this was diluted, by low C.V. carburetted water gas (360-380 B.Th.U.) no material advantage in total make or therms accrued. Another diluent, therefore, had to be found, of as high a C.V. as possible, to enable the maximum to be used. Blue water gas was suitable, but was not available, and the delivery

time for new plant was several years, even if a suitable site could be found.

In Birmingham, having struggled through the winters of 1945-46 and 1946-47, the latter being particularly severe, the position had become acute—so much so that Mr. S. K. Hawthorn, who was then Deputy Engineer-in-Chief to the Birmingham Corporation Gas Department, realised the necessity of taking steps to augment the producing capacity of the existing retort houses, even if only as a short term policy until new base load plant could be built. After careful consideration, it was decided that the only immediate solution was admixture of producer gas with the maximum make of coal gas. There are, of course, objections to using producer gas as a diluent—*e.g.*, low C.V. and high specific gravity—but there is also much to recommend it. It has the advantage of low initial cost, high thermal efficiency, and the ability to use small fuel. Also its very flexible output from 30% to 120% of nominal is easily controlled and allows the retort plant to be worked under optimum conditions without regard to variation in C.V. Again, the manpower required is less than that for C.W.G. and very much less than that for coal gas for plant of the same capacity. The proportions are 1:2½ and 1:6½ respectively, an important consideration in these days of shortage of labour. The intention was to step-up throughputs and reduce steaming, so that the continuous vertical retorts would produce the maximum possible make in volume and in therms at a calorific value of about 480 B.Th.U. This gas would then be diluted with producer gas to the declared C.V. of 450 B.Th.U. It was expected by these means that the thermal output of the retort house would be increased by about 10% to 12%. It was fully realised that if this policy was adopted, about 10% more coal would be used, and about 15% more coke made, with an attendant drop of about 4 therms per ton.

Enquiries were made in many parts of the country to see if it was possible to purchase mechanical producer plants of any kind, new or secondhand. After exhaustive search, secondhand plants were procured, one for each of the Birmingham works, and it is proposed to deal particularly with the installation of a 3 mill. cu.ft. per day mechanical producer by the Power Gas Corporation, at Windsor Street works, purchased in February, 1948, from the Ministry of Supply. It was secondhand, being first erected in 1942, but had worked only two years. Certain of the attendant ancillary plant was not required at Windsor Street, all that was needed being the generator, Lymn washer, cleaners, 15-in. main and valves, and several gauges and instruments.

Description of Plant

The producer, of 3 mill. cu.ft. per day capacity, is 9 ft. in diameter with an annular water jacket surrounding it. This jacket generates steam but is not classed as a steam boiler for insurance purposes. The steam generated is fed into the air blast which is supplied by one of two blowers, the saturated blast then being fed to the underside of the grate in a similar manner to that in which steam is fed to a water gas generator. A bell governor controls the volume of saturated blast, the operating impulse being the pressure at outlet producer.

The grate of the automatic ash discharge type has a variable speed drive and is concentric with the producer. The saturated blast is fed to the centre of the grate, the bottom of the blast tee being water sealed, the upper ortion of the blast main carrying an inner water seal into which the seal plate dips beneath the step grate. An auxiliary steam supply is fitted to the blast main, for use when the water jacket is not steaming. The ash pan has an outer seal into which the curtain plates depend, these latter being fitted with four vertical adjustable ploughs, designed to assist in the ejection of the clinker and maintenance of a level ash bed.

The gas is passed from the producer to the bottom of the water sealed Lymn washer, up which it passes through water sprays and cascades, being cooled and cleaned in the process. It then passes to one of two rotary cleaners, which also act as exhausters, where water, feeding on to the impellers, then drains away to a pit for recirculation. The cleaner further cools the gas, removes from it particles of tar which emanate from the volatile matter in the coke, and raises the gas pressure sufficiently to deliver it to the coal gas foul main via a regulating valve, an orifice meter, and a governor operated butterfly valve.

The foul main is under a pull of 2½ in. to 3 in. W.G., and as it is essential to keep the producer gas main under pressure for some distance past the orifice meter the governor is fitted close to the inlet to the foul main and is set to keep pressure for some distance past the orifice meter, the governor butterfly valve. Blow-offs are situated on top of the producer and washer, and on the gas main for purging purposes. One of two centrifugal pumps, each of 6,000 g.p.m. capacity circulate the water from the underground seals to the sprays at the top and sides of the washer, and to the cleaner feeds.

The fuel is tipped into the hopper at ground level and fed to the overhead storage hopper by an automatic electric skip hoist. The overhead hopper feeds in turn into the charging hopper through a hand-operated gas tight valve. The charging hopper is directly connected to the top of the producer proper, and feeds into it through a counter-balanced cone valve which remains open so long as there is coke above it. Every 10 or 12 min. an electric thruster tries to shut the valve, but can do so only when there is no weight of coke to hold it open. An alarm sounds when it shuts, to warn the operator that it is time to refill the charging hopper.

A great deal of condensation takes place in the gas main after the cleaners as the temperature drops, so that it is essential to have adequate drains at the lowest point of the main immediately after the regulating valve and also near the inlet to the foul main. The following are a few details of the plant.

Capacity of the plant	3 mill. cu.ft. per day
Capacity of the receiving hopper (coke)	10 tons
Capacity of the storage hopper (coke)...	9½ tons
Capacity of the charging hopper (coke)	3½ tons

Diameter of main from cleaners to foul main, 18 in.
Fuel used, No. 3 size coke (⅛ in. to 1 in.), or No. 4 at low gasification rates.

Average Working Conditions

(All pressures are in inches water gauge)

	Pressures.	Temperatures °C.
Air blast	2.2	58 (B.S.T.)
Producer outlet	0.6	430
Washer outlet	−1.5	120
Cleaner outlet	10.0	55
Meter inlet	2.4	53
Foul main inlet	1.1	

Ash dip at side, 4 ft. 6 in. to 4 ft. 10 in.
Ash dip on cap, about 1 ft.
Depth fuel bed, 5 ft. 8 in. to 6 ft.
Ph value circulating water, 7.

Results

When the plant was first started up, it was intended to use coke nuts, size ¼ in. to 1½ in., reclaimed from retort house ashes dry cleaned in a Saxon plant, and this was done for about eight months, when the cleaner was required for another purpose. Since that time, No. 3 coke, size ⅛ in. to 1 in., obtained from the works coke screens, has been used exclusively. As was expected, the results from the No. 3 coke were appreciably better than those from the reclaimed coke. The following figures give the comparison.

	Reclaimed Coke.	No. 3 Works Coke.
Size	¼ in. to 1½ in.	⅛ in. to 1 in.
H_2O, %	15	6
Ash, %	25	10
V.M., %		1.2
Make per ton, cu.ft.	148,395	160,000
Therms per ton ...	175	211
Make per lb. of fuel, cu.ft.	66	71
Bulk density, lb. per cu.ft.	25	22
Average C.V., B.Th.U.	118	132

Gas Analysis, %:	Reclaimed Coke.	No. 3 Works Coke.
CO_2	7.2	6.2
CH_4	0.3	0.4
H_2	9.5	13.0
CO	26.8	27.4
N_2	56.2	53.0
Total inerts	63.5	59.2
Sp. Gr.	0.91	0.885

Using reclaimed coke it was difficult to attain the nominal capacity of the plant, whereas with the No. 3 coke this could be done with comparative ease. Also, the former gave some fire and clinker troubles at times of high make, though, generally speaking, the plant could be run on the poorer quality material without serious difficulty.

Before producer gas was used, the average maximum make at peak periods was about 23 mill. cu.ft. coal gas and 8.7 mill. cu.ft. C.W.G.—total 31.7 mill. cu.ft., say 32 mill.—though on isolated occasions, when coals and conditions have been favourable, higher makes have been attained for a few days. Since the diluent has been used, however, average makes of mixed gas in the region of 26 mill. per day have been maintained with ease, with a further 9 mill. cu.ft. of C.W.G. when necessary.

Conditions of the retort ranges are continually changing, and repairs and/or renewals are carried out each year, so that a strict comparison, even between two consecutive winters, is not true, in that in the intervening summer one or other of the benches may have been patched or re-built. However, as the remaining retorts are one year older, the better results from the repaired range are counter-balanced in some degree by poorer results from the others, so that, on average, the age of all the retorts remains constant.

The record make for one day was December 13, 1950, when a total of 39 mill. cu.ft. was recorded, made up as follows:—29,856,000 cu.f. coal gas and producer gas (C.V. 416), and 9,184,000 cu.ft. C.W.G. (C.V. 534). The quantity of producer gas was 3,631,000 cu.ft. at 132 C.V.

The following is a comparison of two average weeks' results, one with and one without producer gas, the same retorts being at work in each case, but at a period when the maximum make was not required.

	Week Ended Sept. 1, 1951.	Week Ended Sept. 29, 1951.
Coal used, tons	7,790	8,700
Coal gas made, 1,000 cu.ft. ...	139,203	136,294
Producer gas made, cu.ft. ...		12,224
Mixed gas made, cu.ft.		148,518
Coal gas C.V., B.Th.U.	457	476
Producer gas C.V., B.Th.U. ...		133
Mixed gas C.V., B.Th.U. ...		448
Town gas C.V., B.Th.U. ...	450	450
Make per ton coal gas, cu.ft. ...	17,869	15.667
Make per ton mixed gas, cu.ft. ...		17,071
Therms per ton coal gas ...	81.7	74.6
Therms per ton mixed gas ...		76.5
Throughput ± nominal, % ...	−6.0	+6.0
Steaming, % on coal carb'd. ...	15.4	11.1
C.W.G. made, 1,000 cu.ft. ...	34,258	24,557
C.W.G. C.V., B.Th.U.	435	467

Admixture of producer gas gives advantages of:
11.7% more coal used.
6.6% more total make.
4.6% more total therms.

Conclusions

The producer gas plant was installed solely to increase the maximum make from the retort house. It is not claimed to be the best and only method of doing so, but at the critical time of its installation it was the only way to bridge over an awkward period while other plant was being obtained and erected. To be in a really good position as regards productive capacity, a works should have ample coal gas plant with a reserve of C.W.G. for peak periods, but the increases in demand overhauled the increases in coal gas plant undertaken after the war to such an extent that emergency measures had to be adopted—and emergency conditions are likely to continue for some time.

From the results obtained, it can be seen that the extra total gas obtained amply justified the cost of the purchase and erection of the producer gas plant, although at the time, costs were not the primary or deciding factor. Also to the credit of the scheme must be put not only the gas actually made by the plant itself but also the extra gas from the retorts and C.W.G. plant, which cost no more in labour and which would not have been available except for the dilution by the poorer quality gas.

Referring to the higher specific gravity of the mixed gas, thus caused no distribution difficulties, and the extra cost involved was so minute and difficult to assess that it is not regarded as a serious drawback.

An effort has been made to quote reasonably average results at periods of average demands, and not isolated record makes. Carburetted water gas is, of course, tied up with the maximum total production, and the high C.V. sometimes attained (over 500 B.Th.U.) is necessary to enable full use to be made of diluent producer gas, care being taken that the production of water gas within the retorts by steaming was at the economic maximum. In any case, the extra oil therms cause no extra labour or maintenance on the plant.

In these days of little choice of coals for carbonisation and with upwards of 40 different coals used, of greatly differing qualities and characteristics, to attempt to give any set of figures for throughput, steaming, or other retort house conditions is impossible, so that the amount of producer gas to be used each day cannot be accurately predetermined.

The town gas C.V. is kept steadily at the declared quality, because not only are there C.V. recorders on the mixed coal and producer gas and on the C.W.G., but also on the mixture of all three at inlet holder, and this is extremely useful to the supervisor in charge, who can more easily control the quantity of producer gas to be used.

There is no doubt that because of the use of producer gas, the make in Birmingham during the past three winters has been increased sufficiently to satisfy demand without curtailment of supply or reduction of pressure, and no doubt will tide us over the waiting period for the new retort installations to be built. When the coal gas productive capacity is considered sufficient, I do not know whether the admixture of producer gas to straight coal gas will be continued. I imagine not; but in any case, the plants will have served a very useful purpose.

DISCUSSION

Mr. S. Brockbank (Newcastle-under-Lyme) remarked that when he was at Walsall producer gas had been used, with a certain amount of apprehension, to dilute high C.V. carburetted water gas, but after the results obtained this question of dilution was regarded more favourably. However, the value obtained from dilution with producer gas depended largely on the quality of coals going through the retorts. He had found that throughputs could be raised by about 17% when producer gas was used, and he wondered whether the author had gone to the limit of throughput on the coal gas plant to get the maximum benefit from the dilution. He thought that the attitude of the managements towards the cost of gas production had changed of late and they seemed prepared to accept lower therms per ton as long as sufficient gas was produced.

Mr. Ward said that the results quoted were only average, and higher ones had been achieved, but it largely depended on the type of coals being carbonised. With some coals it would be impossible to introduce the maximum producer gas. With smaller works, where a regular supply of one type of coal was available, conditions could be set to suit that particular coal, but at works of the size of Windsor Street, where up to 40 different types of coals were being delivered, it was impossible to do this. The throughput had to be varied according to the type of coal being carbonised if the resultant gas was to be steamed down to 450 C.V.

Mr. J. Foxton (Cheltenham) was rather surprised that the reclaimed coke gave poorer results on the producer than the No. 3 coke, as he considered it should be more reactive, and he queried whether the reclaimed material had been properly cleaned. Also the size of the reclaimed coke should have necessitated a bigger throughput. He would also like to know if Mr. Ward had considered the use of a poor grade coal for producer gas.

Mr. Ward replied that with the reclaimed coke the throughput had to be increased if maximum make was required. The figures proved that the reclaimed coke was a poorer fuel than No. 3 coke and did not give as good results as the No. 3 coke in any way. Clinker difficulties were experienced if the plant was run for any length of time under maximum conditions. In regard to the use of low grade coal, producer plants to use this fuel were installed at the other Birmingham works, but the paper specifically dealt with the plant at Windsor Street which was designed to operate on coke. The other works made gas of a higher C.V. and therefore more producer gas could be used as a diluent.

Mr. J. A. W. Stretton (Wales Gas Board) remarked that an enquiry had been received in his area recently from a firm concerning the supply of a large volume of gas, and as it was doubtful whether this could supplied by the gas undertakings the firm was prepared to install its own producer gas plant. He wondered whether Mr. Ward had any idea of the cost per therm of such a plant.

Mr. Ward replied that it was difficult to assess the cost of making producer gas, as it was mixed with coal gas immediately and the price per therm was worked out on the mixed gas. However, he had made certain investigations which had given a figure in the region of 6d. per therm.

Mr. Stretton said this figure agreed exactly with that arrived at by the chemists at the works concerned.

Mr. Foxton said that after a similar enquiry in his area a price of 10d. per therm had been quoted.

Mr. J. A. Tomes (Stourbridge) said he had made a rough estimate that to produce the amount of reclaimed coke required for the producer plant it would be necessary to carbonise about 9,000 tons of coal per day; and he wondered whether the plant could have been maintained on this fuel throughout the winter period.

Mr. Ward replied that it was not the practice to run the producer plant at its maximum at all times. During the eight months when it had been operated on reclaimed coke it was being worked at only about half capacity and the supplies had been adequate.

Throughput

Mr. Tomes referred to the figure of 6% below nominal throughput and asked if this was the maximum which could be obtained. as he thought that nowadays throughputs should usually be above nominal.

Mr. Ward remarked that the figures quoted were not maxima, but only examples of average working when plant of similar capacity was in operation. Much depended on the prevailing conditions and the demand for gas. Throughputs could be increased to 10% or 12% above nominal with suitable coals if desired.

Mr. S. K. Hawthorn (Birmingham) said that in Birmingham only continuous vertical retorts were used, and while producing a gas of 450 C.V. with the coals available throughputs could not exceed 0.90 to 0.95 ton per 10 in. major axis. The management was well aware that it could increase throughputs with consequently a higher C.V., but this would need diluting down to the declared C.V. of 450 B.Th.U. A vertical retort produced both coal gas and water gas, the latter requiring a large amount of heat for its generation, and he considered it incorrect to use heat from the flues, via the retort walls, to generate extra water gas. It was better to use this heat exclusively for carbonising higher throughputs of coal. The makers of continuous vertical retorts maintained that these retorts would produce the same amount of therms per day over quite a wide range of C.V.'s, perhaps from about 430 to 480 or 490, depending on the type of coal. Mr. Hawthorn, however, did not agree with this, and contended that only that quantity of water gas should be made in the retort which could be produced from the residual heat in the coke, thus allowing the carbonisation of higher throughputs. Having decided that more therms per day could be obtained by increasing throughputs and C.V., it was decided also to dilute with producer gas, which, though having some disadvantages, had many points in its favour. Producer gas plant was cheap and quick to install and flexible to handle and was also fundamentally efficient from a thermal point of view, more so than C.W.G. plant. Producer gas could be made from No. 3 or 4 coke whereas B.W.G. required No. 1, although occasionally No. 2 coke might be used. However, since B.W.G. had a C.V. twice that of producer gas, the thermal value of the B.W.G. which could be added was four times that of producer gas. Blue water gas was, therefore, probably the cheaper diluent.

When producer gas was first mooted in Birmingham the intention was simply to dilute the high coal gas C.V. down to 450, but the other possibility was quickly adopted—*i.e.*, that of using the maximum make of producer gas and using more oil on the C.W.G. plant to maintain the declared value. This gave a wonderful fillip to the make and had proved very useful. Another advantage with producer gas was the simplicity of the control of the admixture to the coal gas stream. It was also a great relief to have no worry about maintaining a steady C.V. on the coal gas by frequent variation of throughput or steaming and to maintain a maximum throughput and dilute as necessary with producer gas.

The author had raised the question as to what would happen in the future in regard to the use of producer gas. He (the speaker) would state that on the new works at Swan Village, in order to obtain the best return on capital expended on the project the coal gas plant would work at maximum throughput at a C.V. of 490-495, dilution being effected by blue water gas, with a further reserve of about 1 mill. cu.ft. of producer gas, if necessary, from the mechanical producer installed for retort heating. He believed that this provided the arrangement which gave the maximum return for money spent.

On the question of throughputs, Mr. Hawthorn said Birmingham operated for long periods at an average of 12% or 13% above nominal, but it was important to point out that the larger the retort the less above nominal it could be worked.

Mr. Ward said that, when the life of retorts was referred to, the figure to be quoted should be the amount of coal carbonised and not the period worked. He knew that Mr. Hawthorn believed in high throughputs, and as a point of interest he had worked out a figure of tons per 10 in. major axis carbonised from one rebuild to another. This was in the region of between 3,500 and 4,000 tons.

Effect on Scaling

Mr. F. J. Bengough (Birmingham) mentioned the question of the temporary suspension of scaling during extra peak load outputs. It was not the practice to do this in Birmingham, except as a last resource. As these periods were normally of only short duration, sometimes the extra make effected was not felt at the time it was wanted, and as the practice played havoc with the scaling programme, which must be kept up to date, scaling was not suspended if it could be possibly avoided. Secondly, he pointed out that to make full use of the producer plant good team work was essential. This applied to all the other sections as well, as any hold-ups on other plant had repercussions on the use of the producer gas. It concerned not only gas-making plant but purifiers, etc. When purifiers were operating at peak conditions the overload had to be taken up without additional air, so that the maximum use could be made of the producer plant. Again it was no use expecting the most out of the retort house unless supplies of good quality coke were available, and this depended on the efficient working of the coke screening plant.

Mr K. J. Crane (Birmingham) said it was appreciated that the use of diluents came about through necessity, which was likely to be with them for some years to come. Even though the financial aspect had lost some of its significance, they must realise that they were very short of coal, and when it came to working the retorts at throughputs of about 10%-12% above nominal he urged that allowance was made for adequate supervision in the retort house to ensure that no wastage took place.

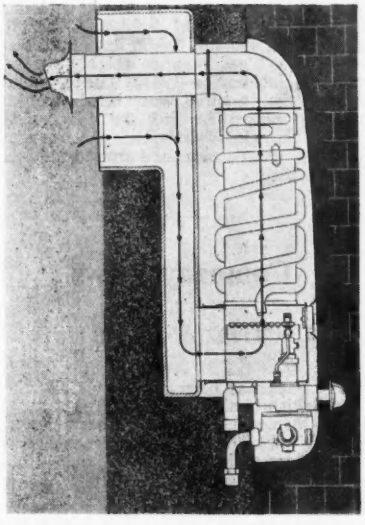
Mr. Foxton remarked that so far the question of dilution with producer gas had centred around vertical retorts, but as a large proportion of gas-making plants were of the horizontal type it was most important to know how the practice would work with plant of this nature. Also, when the question arose as to whether the dilution was to be effected by producer gas or C.W.G., he contended that it should be remembered that if the gas industry was to consider itself as a two-fuel industry preference should be given to producer gas in order to leave as much coke as possible available for sale.

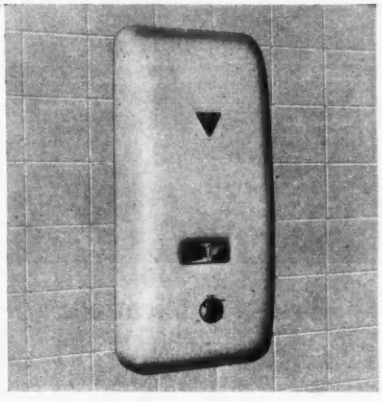
Mr. Ward said he saw no reason why producer gas should not be used with success in conjunction with horizontal retorts.

TRADE NEWS

Balanced Flue Multipoint

SINCE the Ideal Home Exhibition of 1949, when Ascot Gas Water Heaters, Ltd., showed a prototype instantaneous multipoint water heater designed on the balanced flue principle we have looked forward to the 'general release' of the finished and approved appliance. Hence our interest in the Type 715 multipoint publicly exhibited for the first time at the Building Exhibition held last month at Olympia. Much development work had in fact been carried out by the firm on this advanced water heater before even the prototype was shown, and since that time further research and experiment under severely practical conditions have resulted in Ascot's assurance and confidence in placing the finished appartus on the market. Throughout we have followed this work closely, and we are sure that the balanced flue principle has a great deal to offer to the gas industry, to the architect and builder, and to the user —that is, of course, if, as is the case with the 715, the principle and its implications are thoroughly understood and scientifically applied.





Left: A diagram showing the circulation of fresh air and products of combustion through the enclosed ducts and heating body.

Right: The attractive and unencumbered casing.

In the development work to which we refer—and it has been a good example of the long-term approach—Ascot was fortunate in the extensive laboratory facilities at its disposal, and it was able to take advantage of the experience gained in the firm's laboratories during the war on hydraulics, aero-dynamics, and pneumatics. The main problems associated with the balanced flue design are the prevention of the recirculation of waste flue gases due to varying wind direction and the effects of unstable pressures caused by eddies of changing wind velocity. For the solution of the problems special and delicate instruments were used, including the Ascot Casella micromanometer and the Nash and Thompson photo-electric controller. A wind tunnel was employed in the experiments. Extensive tests in the laboratory were followed by district tests under most adverse conditions.

Our illustrations of the New Ascot Type 715 multipoint indicate the principle of operation and also give an idea of the remarkably neat appearance of the appliance. The heater is, in the first place, totally enclosed; no products of combustion can escape into the room in which it is fitted. Hence it can be installed in a confined space without any possibility of vitiation of the atmosphere. The maximum projection in the room is a matter of five inches only. With the sealed air-flue gas circuit there is no need for draught diverter and vertical flue outlet, and the reduced overall height makes the heater particularly applicable for buildings where reduced ceiling height is specified. It is also specially suited to multi-storey buildings—a most important consideration in view of planned and likely future building development. Indeed, the heater, developed mainly as a contribution to new housing, is in keeping with modern building techniques.

Turning to the operation of the appliance, the air necessary for combustion is drawn through a duct from the external atmosphere, the products of combustion being exhausted through an adjacent flueway. The circulation of air and products of combustion through the enclosed ducts and heating body are shown in our diagram. Any wind condition which affects the pressure at the air inlet similarly affects the flue outlet. Thus the pressure balance at the terminal is maintained. To minimise internal friction losses a newly-designed single stage heat exchanger is incorporated. The photograph we reproduce shows the clean contours of the appliance. The finish consists of white or cream vitreous enamel casing with black plastic and polished metal controls.

We give the following details of the Ascot Type 715.

Input.—1,625 B.Th.U. per min. (3.25 cu.ft. per min. of 500 B.Th.U. gas).

Output.—Approximately 3 gal. per min. raised through 40°F., 2¼ gal. through 50°F., 1 gal. through 100°F.

Overall Dimensions.— Height, 2 ft. 7½ in., width 1 ft. 3¾ in. (without casing, 1 ft. 1⅜ in.), depth 10¼ in.

Pilot Gas Rate.—0.5 cu.ft. per hour.

Adam and Harvey

Details of a new tool called the 'Rapid-Hammer' have recently been published and exhibited at the Building Exhibition. It is really a gun which shoots specially hardened steel bolts into concrete, brickwork, iron and steel, thus eliminating drilling, chiselling and plugging. It is fired by means of a small cartridge which is available in four different strengths to comply with the differing resistance of the metals to be operated on. It is easily and safely operated by unskilled labour. Details are available from: *Adam and Harvey, Ltd., 9-10 Tokenhouse Yard, E.C.2.*

British Tyre and Rubber

For underground service the above company has recently introduced a special belt under the brand 'Pitmaster.' The first of its kind has just been put into work at Ryhope Colliery, Durham. It is a 42 in. by 7-ply high-tensile job, 7,500 ft. long. It was delivered to site in 630 ft. coils weighing 3 tons each, prepared at the factory for 'Tylock' splicing underground. The conveyor structure was designed, built and installed by Hugh Wood & Co., Ltd., a drive head of 150 h.p. being provided. All work was completed by scheduled date during the annual holiday break, thus avoiding loss of coal production.—*British Tyre & Rubber Co., Ltd., Herga House, Vincent Square, S.W.1.*

Corrosion, Ltd.

We have received a leaflet giving particulars of a new range of refractory coatings. These coatings are of 'Furnascope,' for which the makers, Corrosion, Ltd., state gives a monolithic, vitreous, airtight lining to furnace walls. It is claimed that 'Furnascope,' which is used for protecting, preserving and repairing refractories, prevents the spalling or cracking of refractories, minimises the effect of slagging of all types, and serves as a protection against abrasion from flying ash, and, by reason of its plasticity, against thermal shock. 'Furnascote' is available in several different types designed to meet the requirements of different funace-operating conditions. The leaflet also contains information on 'Furnascote Nonvit' coating, which is non-vitreous. 'Furnascote Nonvit' can be used on either acid or basic refractories, and resists the deposition of slag—*Corrosion, Ltd., Southampton* (*London office: 351, Coastal Chambers, Buckingham Palace Road, S.W.1.*)

British Aluminium Co.

As from December 1, the head office address of the British Aluminium Co., Ltd., will be Norfolk House, St. James's Square, London, S.W.1. (Telephone: Whitehall 7868).

Norfolk House was built in 1938 on the site of the Duke of Norfolk's residence, and the company was to have moved there in September, 1939. At the outbreak of war, however, the building was requisitioned and used later as the Supreme Headquarters of the Allied Expeditionary Force. In the company's board room, General Eisenhower and his staff planned and launched the allied operations for the liberation of North Africa and the continent of Europe.

Guards for Gas Fires

WITH reference to recent British Standards specification relating to the provision of guards for gas fires, such guards are already available for Main 'Newscreen' portable fires (shown on right) and for their 446 panel fire. Designed at Main's Falkirk works, these new guards comply fully with the requirements of the addendum to B.S. 1250, Part 2, and have been so designed as not to detract from the appearance of these fires. The Main 'Glowmain' portable heater has, since its re-design in 1938, incorporated a dress guard in its standard form. This guard also complies with the latest specification. When considering these recent developments, it is interesting to recall that Main's 'Author' and 'Shakespearean' series of fires were available with guards some thirty years ago.

Lewis and Tylor

For working out the most efficient and economical width of belt for any particular drive a new calculating rule has been designed which can be used by those who may be unfamiliar with the ordinary slide rule. To find the belt required for any particular drive it is only necessary to set the slide so that the pulley diameter coincides with the pulley revolutions per minute. It is then possible to read off at a glance belt speed in feet per minute and the width of the belt required to transmit any given horse power.

The 'Gripalculator' may also be used in a variety of ways when designing belt drives. For example, when given size and speed of motor pulley the speed or diameter of the driven pulley can be determined without further setting. Also, the corresponding belt speed can be read through a window in the slide for all settings of the slide. A table also provides the minimum recommended pulley diameters for all thicknesses and types of belting. This simple procedure is achieved by the use of a reversed logarithmic scale which enables all the required answers to be given with one setting of the slide. Width and thickness is given alternatively in solid woven hair belting, rubber and canvas ply belting and belting woven from filastic yarn. These three types of belting are made by Lewis and Taylor under the well-known brand names of 'Gripoly,' 'Gripolata' and 'Gripolastic' belting.

The instrument is a most attractively produced precision calculating rule, made in transparent plastic, which can be easily carried in the pocket. No engineer who is concerned with getting the best service from his power transmission belting should be without one.—*Lewis and Tylor, Ltd., Gripoly Mills, Cardiff.*

Trade Publications

We acknowledge with thanks the following:—

Crossley Bros., Ltd. — Crossley Chronicle No. 146 dealing with the new Openshaw Foundry and its excellent amenities and advantages for producing high quality castings.

General Refractories, Ltd.—Folder containing details of nine types of refractory bricks. Chemical and physical test data are given for each.

Greenham Equipments, Ltd.—Catalogue of new equipment. Special attention drawn to the 'Eezion' trailer and the Johnson pumps. Many machines available from stock.

Lyte Ladders, Ltd.—List 4A dealing with all types and descriptions of ladder with special reference to particular requirements.

Wm. Whitehouse & Co., Ltd.—Catalogue No. G.73 which covers extensively their gas and water fittings.

General Electric

A new equipment for measuring mechanical quantities electrically and for indicating the results at a distance has been developed by the Research Laboratories of the General Electric Co., Ltd., and Salford Electrical Instruments, Ltd. The system has a wide range of industrial applications, including gas, liquid, and steam pressures; liquid levels; load indication on cranes, hoists, and lifts; positional indication (*e.g.*, valve indication at remote point); temperature measurement.

Operation is from alternating current mains and the indications can be transmitted directly over several miles. The basic principle of the system is that of a change of inductance in a circuit, and the inherent difficulties of earlier change-of-inductance systems, due to magnetic leakage, temperature errors, and poor electro-mechanical efficiency have been overcome by the use of a new magnetic powder material 'Gecalloy PL.' The new system is simple and robust and can be operated and maintained by unskilled personnel. Overall accuracy is high and is unaffected by variations of ambient temperature. Power consumption is small and there are no amplifiers to maintain, contacts to keep clean, or moving parts to give trouble.—*General Electric Co., Ltd., Magnet House, Kingsway, W.C.2.*

Falk, Stadelmann & Co., Ltd., of Veritas House, Farringdon Road, London, E.C.1, recently received a letter from a 70 year-old lady, of Brixton, stating that she still has in her possession a 'Veritas' gas mantle which survived a bomb incident in 1941. The room in which the mantle was fitted had a window blown in and the blast also broke the glass all round the mantle, but the mantle was undamaged and is still in use.

Company News

CELLACTITE AND BRITISH URALITE

An issue has been made by Cellactite and British Uralite of £100,000 5½% unsecured loan stock, which has been placed privately by the Industrial Finance and Investment Corporation.

DANISH GAS

Profit of the Danish Gas Company for the year ended June 30 after all charges and transferring Kr.400,000 (Kr.300,000) to renewals account, Kr.255,245 (Kr.210,976). Dividend 8% (4%), forward Kr. 11,055 (Kr.62,886).

WOODALL DUCKHAM

The Directors of Woodall-Duckham, Ltd., have declared an interim dividend of 5%, less tax, for the year ending December, 31, 1951, payable on that date to all shareholders on the Company's Register on December 14, 1951. Last year, no interim dividend was paid. A dividend of 15%, less tax, was paid for the year.

WALTER KING SERVICES

PERIODICALS . . .

GAS JOURNAL. *(Weekly.* Wednesday, By Post, **1s. 5d.)**

The "Gas Journal" has existed as an integral part of the Gas Industry since 1849. Unbiased policy, technical knowledge, accuracy and reliability combine with an extensive news service and modern make-up to make the Journal the leading Gas Industry newspaper.

Annual Subscription (including a copy of the "Gas Journal" Calendar and Directory): Home and Empire, **52s.** ; Foreign, **60s.**

GAS SERVICE. *(Monthly.* By Post, **1s. 2d.)**

"Gas Service" is the specialist magazine for the Sales and Service personnel of the Industry. It covers all aspects of gas service from the holder to the burner. In addition to sound editorials, news items and specially contributed articles, "Gas Service" also reports in the fullest possible manner the activities of the numerous Salesmen's Circles.

Annual Subscription : Home and Empire, **12s.** ; Foreign, **15s.**

BOOKS and ANNUALS . . .

Some current works covering the manufacture, distribution, and sale of gas are :—

KING'S MANUAL OF GAS MANUFACTURE. Now being issued in 10 self-contained sections. Full details of the sections ready and prices, are published regularly in the "Gas Journal" in a separate announcement.

MANUAL OF GAS FITTING. By R. N. Le Fevre. **30s.**

GAS DISTRIBUTION ENGINEERING. By R. N. Le Fevre **22s. 6d.**

Governors and Governing (Parkinson), **22s. 6d.** ; **High Pressure Gas Main Construction** (Restall), **10s. 6d.** ; **Retort House Technical Control** (Myhill), **12s. 6d.**

ANNUALS:—

"Gas Journal" Calendar and Directory, 25s. ; "Gas Service" Pocket Book 4s.

BINDING . . .

In addition to permanently binding subscribers' journals, (particulars and prices for which we shall be pleased to give on application) we can supply TEMPORARY BINDERS for the Gas Journal, Gas Service and King's Manual of Gas Manufacture, thus enabling readers to *bind their copies as received.* The danger of mislaid or damaged copies is eliminated.

Gas Journal temporary binder } . . . . . **13s. 3d.** each inc. postage.
Gas Service " }
King's Manual " . . . . . **9s. 9d.** each inc. postage.

PHOTOGRAPHY . . .

Walter King Photos specialize in Gas Industry photography of every description—work in progress series, plant, appliances, showroom displays, exhibition stands, social and educational visits of all kinds. Tours for various areas of the country can be arranged. First class photography at competitive rates. Full particulars on application.

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Telephone: DUNSTABLE 90
The Clifford Engineering Co., Ltd.
Dunstable, Beds.
Specialists for over 30 years
Annual production over 700,000 cranks

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SAVILE TOWN, DEWSBURY, YORKS.
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"BROWNOX-de-LUXE" PURIFYING MATERIAL
Purchase:–
SPENT OXIDE

COMPRESSORS & EXHAUSTERS FOR AIR AND GAS.
See our Advertisement Next Week.
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JOINTS, GASKETS, WASHERS,
in RUBBER or ASBESTOS
CENTRAL MANFG., & TRADING CO. (DUDLEY) LTD.
OLD HILL STAFFS.
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"EVERYTHING IN ASBESTOS."

There are types and ranges of
"DEAD-BEAT" PRESSURE & VACUUM RECORDERS
for every need
Specials include: strip-chart recorder with gauge for official pressure recording; twin-chart drum recorders, and also twin strip-chart recorder; batteries and panels. Always specify **Simmance Patent** "Dead-Beat" Recorders.
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WESTMINSTER, S.W.I.

UNDERPRESSURE ENGINEERING CO., LTD.
UNDERPRESSURE CONNECTIONS
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'Phone: MANSFIELD 1256. *'Phone:* TEMPLE BAR 9910.
'Grams: CASTINGS, MANSFIELD. *'Grams:* WASHER, ESTRAND, LONDON.
CENTRAL ACTION DRILL STANDS
SERVICE CLEANSERS
TOOLS, ETC.

EB Service in WELDING SPRAYING GUNNING of GAS RETORTS
Write for particulars of how E.B. experience can help in reducing maintenance costs in refractory constructions.
Manufacturers of all types of Cements.
E. B. REFRACTORY CEMENT CO. LTD.
OAKFIELD OFFICES, BRETTELL LANE, STOURBRIDGE

RETORTS MADE GAS TIGHT
when patched with–
ONX SUPER 83 BRAND FIRE CEMENT

A recent testimonial from Gas Dept.
"We are pleased with results obtained after using ONX Super '83' Brand.
"Our settings were very bad, with large cracks in retorts, and portions of wall actually collapsed.
"Now, six months after repairing 28 retorts they appear as sound as ever; we anticipate the life of the settings will be prolonged."
A. L. CURTIS & CO., *Westmoor Works,* CHATTERIS, *Cambs., Eng.*

WALTER SLINGSBY & CO. LTD.
ARE THE MAKERS
OF
WASK TRADE MARK
MALLEABLE IRON
PIPE FITTINGS
FOR
OVER FIFTY YEARS
OVER 5,000 TYPES & SIZES
FOR
GAS, WATER, STEAM, OIL AND BENZOL
AIR TEST AND TAPER THREADS GUARANTEE THEIR UNFAILING SERVICE
Please write us at:–
NEW DAM WORKS, KEIGHLEY.
'Grams: Malleable, Keighley. 'Phone: Keighley 3749 (2 lines)

PUBLISHERS' NOTICE

The "Gas Journal" is published every Wednesday, price 1/3d.; by post 1/5d.

Subscription Rates : Home and Empire :- 52 - per annum ; Foreign :- 60 - per annum. (Both payable in advance.) A copy of the "Gas Journal" Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements : All small classified advertisements are charged at 1/9 per line (approx. 7 words) - minimum charge 10 6. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements : Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10" deep x 7" wide ; block screen 120.

BUSINESS MANAGER : S. T. CULLEN

MIDLANDS OFFICE : 10, Union Street, Birmingham.

NORTHERN MANAGER : W. Q. Foster, 33, St. Helens Road, Harrogate. 'Phone : Harrogate 84291.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone : CENtral 2236-7. Telegrams : Gasking, Fleet, London.

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SPECIALLY ACTIVATED OXIDE OF IRON

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Tins for Sale to Consumers. In Bulk for Works Use

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Pressure-operated by sealed CO_2 Charges

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In Every Ship of the Royal Navy

APPOINTMENTS VACANT

AUTOMATIC Temperature and Safety Controls: FOREMAN required to take charge of assembly shops. Good pay and prospects for skilled and energetic man with similar experience. Please give full details in your written application, or 'phone Works Manager for appointment.—Perl Controls Limited, 672, Fulham Road, London, S.W.6. RENown 2323.

EASTERN GAS BOARD

TOTTENHAM DIVISION.

APPLICATIONS are invited for the following appointments:—

POWER ENGINEER—
WILLOUGHBY LANE WORKS.

Candidates should be Corporate Members of the Institution of Electrical Engineers or hold an equivalent qualification.

The duties will mainly comprise:—

(*a*) Technical supervision of operation of steam and electric power plant.
(*b*) Supervision of electrical installation work, maintenance of electrical plant, including supervision of craftsmen.

Residence, adjoining the Works, will be available in this case at a reasonable rental.

MECHANICAL ENGINEER—
DIVISIONAL OFFICE.

Candidates should be Corporate Members of the Institution of Mechanical Engineers or hold an equivalent qualification.

The responsibilities cover the eight gas works of the Division and the duties will mainly comprise:—

(*a*) Supervision of all mechanical requirements under the Factories Acts, *e.g.*, steam boilers and pressure vessels, gasholders, lifting appliances, etc.
(*b*) Safety precautions.
(*c*) Inspection of mechanical plant at makers' works and supervision of erection.

(The Works Engineers in each locality are responsible for mechanical maintenance).

MECHANICAL ASSISTANT—
PONDERS END WORKS.

Candidates should be Corporate Members of the Institution of Mechanical Engineers or hold an equivalent qualification.

The candidate appointed will be one of the two main technical assistants of the Works Engineer, the other being the Production Assistant. He will be responsible for mechanical and structural maintenance and must be capable of organising this work on a planned basis.

Candidates should have experience in steam and diesel plant and in the supervision of craftsmen.

Candidates for all the above posts should be between 27 and 45 years of age. The successful candidates will be required to pass a medical examination and to join such contributory superannuation scheme as the Board may adopt.

All the above appointments will be made within the Grade A.P.T. XI (Metropolitan) (£675 to £800 p.a.) of the National Salary Scales for Gas Staffs.

Applications, stating age, qualifications and experience, should reach the Personnel Officer, Woodall House, 658, Lordship Lane, London, N.22, not later than January 1, 1952.

December 1, 1951.

NORTH EAST FIRM of Chemical and Gas Plant Engineers require DEPUTY TO CHEMICAL RESEARCH MANAGER. Good academic qualifications. Industrial experience desirable. Graduates in Physical Chemistry preferred, specialists in other lines would be considered. Post involves supervision as well as research and development work. Five-day week, Pension Superannuation Scheme. Excellent prospects. Apply No. 9988, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

NORTH THAMES GAS BOARD

THE following Drawing Office Staff are required in the Chief Engineer's Department.

1. JUNIOR DRAUGHTSMEN (3) at Beckton, E.6, Slough, Bucks., and Lea Bridge, E.10. Applicants should preferably have had some experience in the maintenance of gas plant and be conversant with the design of steel structures and lay-out of buildings. Starting salary within the range £295 per annum to £535 per annum, according to age, qualifications and experience.

2. DRAUGHTSMEN (2) at Westminster.

(*a*) Experienced in the design, layout and detailing of mechanical handling plant.

(*b*) Experienced in the design, layout and detailing of any of the following:—Coal Carbonising Plant, Coke Oven Plant, By-Products Plant, Pipe Layouts or Steel Framed Structures.

Applicants should be about 30 years of age. Starting Salary within the range £570 per annum to £650 per annum, according to age, qualifications and experience.

All the above appointments are of a permanent nature and pension arrangements will be discussed at interview. Applications, stating age and full particulars of training and experience, should be sent to the Staff Controller, North Thames Gas Board, 30, Kensington Church Street, W.8, quoting reference number 79.

SCOTTISH GAS BOARD

NORTHERN DIVISION—

INVERNESS DISTRICT.

ASSISTANT MANAGER.

APPLICATIONS are invited for the position of ASSISTANT MANAGER of the above Undertaking.

Candidates should possess the Higher Grade Certificate (Manufacture) of the Institution of Gas Engineers and have experience of Vertical Retorts and control of works plant generally.

The Salary applicable to the post is Grade VIII (Provincial 'A') of the National Salary Scales—£540-£620 per annum. Placing in the scale will be in accordance with qualifications and experience.

Candidates should state if they meantime hold a superannuated position. The successful candidate may be required to pass a medical examination.

Applications giving particulars of training, experience and qualifications, together with *copies* of two Testimonials should be addressed to the undersigned to arrive not later than Monday December 24, 1951.

JOHN FORD,
District Manager.

Gas Works,
Manse Place,
Inverness.

(*Classified advertisements continued on Supplement* 4)

APPOINTMENTS VACANT (ctd.)

WALES GAS BOARD

MERTHYR TYDFIL & DOWLAIS UNDERTAKING.

FULLY EXPERIENCED GAS FITTER required. Accommodation, on works, would become available in 1952 at a nominal rental. Provincial 'A' rates. Applications to General Manager, Gas Offices, Merthyr Tydfil, Glam.

WALES GAS BOARD

CHIEF ACCOUNTANT'S DEPARTMENT.
INCOME TAX ASSISTANT.

APPLICATIONS are invited for the above permanent appointment at a salary of £1,000 per annum.

Applicants should be fully conversant with the law, practice and procedure relating to income tax and profits tax, and have extensive knowledge thereof as applied to the gas industry or similar public utility organisation.

The person appointed may be required to assist generally in the work of the department, and a recognised accountancy qualification, and/or experience of public utility accountancy, will be desirable but not essential.

The successful candidate will be required to pass a medical examination and, subject to any protected superannuation rights, will be required to subscribe to such superannuation scheme as the Board may adopt.

Applications, furnishing personal details and particulars of experience and qualifications, with the names of two referees, should be sent to the undersigned to arrive not later than two weeks after the appearance of this advertisement.

C. B. MAWER,
Secretary.

1/2, Windsor Place,
Cardiff.

WALES GAS BOARD

1. GROUP TECHNICAL ASSISTANT—

CAERNARVON GROUP.

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT to the Caernarvon Group of Undertakings.

Applicants should have had all round experience in carbonisation and the manufacture of carburetted water gas, with particular reference to complete gasification in Tully Plants, and should hold the Ordinary Grade Certificate of the Institution of Gas Engineers in Gas Engineering (Manufacture).

Candidates should be qualified by training and experience to undertake technical supervision of gas manufacturing processes within the Group of Undertakings. Ability to drive a car is a desirable qualification.

The salary will be in accordance with Grade A.P.T. VB (£410-£490 per annum). The successful applicant will be required to pass a medical examination and will be subject to the provision of any superannuation scheme which the Board may introduce.

Applications, stating age, training, qualifications and experience, should be posted to reach Mr. J. R. Wood, Caernarvon Group Chairman, Gas Works, Bangor, Caerns., not later than December 22, 1951.

2. MAINS & SERVICE FOREMAN—

MID-WALES GROUPS OF GAS UNDERTAKINGS.

Applications are invited for the position of WORKING MAINS & SERVICE FOREMAN to the Mid-Wales Groups of Gas Undertakings of the Wales Gas Board.

The post is graded under the Intermediate Grades Agreement VB (£375-£420 per annum). The successful applicant may be required to pass a medical examination.

Particulars and forms of application are obtainable from the Engineer and Manager, Wales Gas Board Aberystwyth Undertaking, Park Avenue, Aberystwyth, to whom applications must be sent not later than December 22, 1951.

DRAUGHTSMEN (Senior and Detail) required by well known firm of Furnace and Gas Plant Engineers for their London Office. Five-day week. Staff Pension Scheme. Write stating experience, age and salary required to: The Wellman Smith Owen Engineering Corporation, Ltd., Parnell House, Wilton Road, London, S.W.1.

CHEMICAL PLANT ENGINEER, age 30-40, required as DEPUTY CHIEF ENGINEER, by Engineering Company in Sussex. Experience in design and erection of Gas Works By-Product or Tar Distillation Plants desirable, but not essential. Permanent position. Pension scheme, Canteen, etc. Salary £1,000 to £1,250. Write, stating age, experience, etc., to The Chemical Engineering & Wilton's Patent Furnace Co., Ltd., Horsham, Sussex.

SOUTHERN GAS BOARD

PORTSMOUTH, GOSPORT & BOGNOR REGIS GAS UNDERTAKING.

VACANCIES exist for qualified First, Second and Third Class GAS FITTERS within the area of the above Undertaking, principally at Portsmouth and Bognor Regis.

Applications, giving full particulars of training and experience should be addressed to The General Manager, Portsmouth, Gosport and Bognor Regis Gas Undertaking, The Square, Portsmouth.

EASTERN GAS BOARD

WATFORD DIVISION.

INDUSTRIAL GAS ENGINEER.

APPLICATIONS are invited for the position of an INDUSTRIAL GAS ENGINEER in the Watford Division. Applicants should have had experience in the design, construction and installation of industrial and commercial plant covering a range of representative industries and should be suitably qualified by examination.

The commencing salary will be not less than Grade XI A.P.T. ("Fringe" Metropolitan) according to experience. The successful candidate may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may adopt.

Applications stating age and giving full particulars of education, training, qualifications and experience, should be sent not later than December 22, to the General Manager, Eastern Gas Board, Watford Division, Radiant House, Clarendon Road, Watford, Herts.

PLANT FOR SALE & WANTED

WANTED: BALLARD GAS FRYING OVEN, triple cased, 6 ft. × 4 ft. × 5 ft. or nearest, new or secondhand.—Brayhead, 118, Kennel Ride, Ascot.

PHONE 98 STAINES

FOR SALE: 26 kW. "Tangye" DIESEL GENERATING SET 220 v. D.C. "Cochran" Oil Fired Boiler 16 ft. 6 in. × 7 ft., 100 w.p. Two—R.S. OPEN TOP TANKS 12 ft. 6 in. deep × 8 ft. × 8 ft. 20 h.p. Diesel Loco., 24 in. gauge. CENTRIFUGAL PUMP by "Pulsometer" 200 g.p.m. 43 ft. hd.—400/3/50, many others. Geared COKE CRUSHER—Toothed roll 13 in. × 7½ in. with screen. Two—STEEL SECTIONAL TANKS, 8 ft. × 8 ft. × 4 ft. deep.

HARRY H. GARDAM & CO., LTD.

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CLOCK CONTROLLER REPAIRS.
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Canonbury 2049 Brifulson, Nordo, London.

THE BRITISH GAS PURIFYING MATERIALS CO., LTD.
NATURAL BRITISH.
DUTCH BOG ORE.
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LONDON ROAD, LEICESTER.
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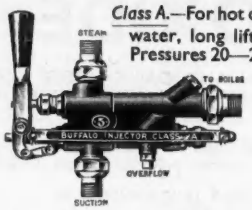
BUFFALO INJECTOR



Class A.—For hot or cold water, long lifts, etc. Pressures 20—200lbs.

Please send for Catalogue

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The only Journal covering fully all aspects of the sales and service side of the Gas Industry:—

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★ DIARY AND PERSONAL
★ SPECIAL ARTICLES
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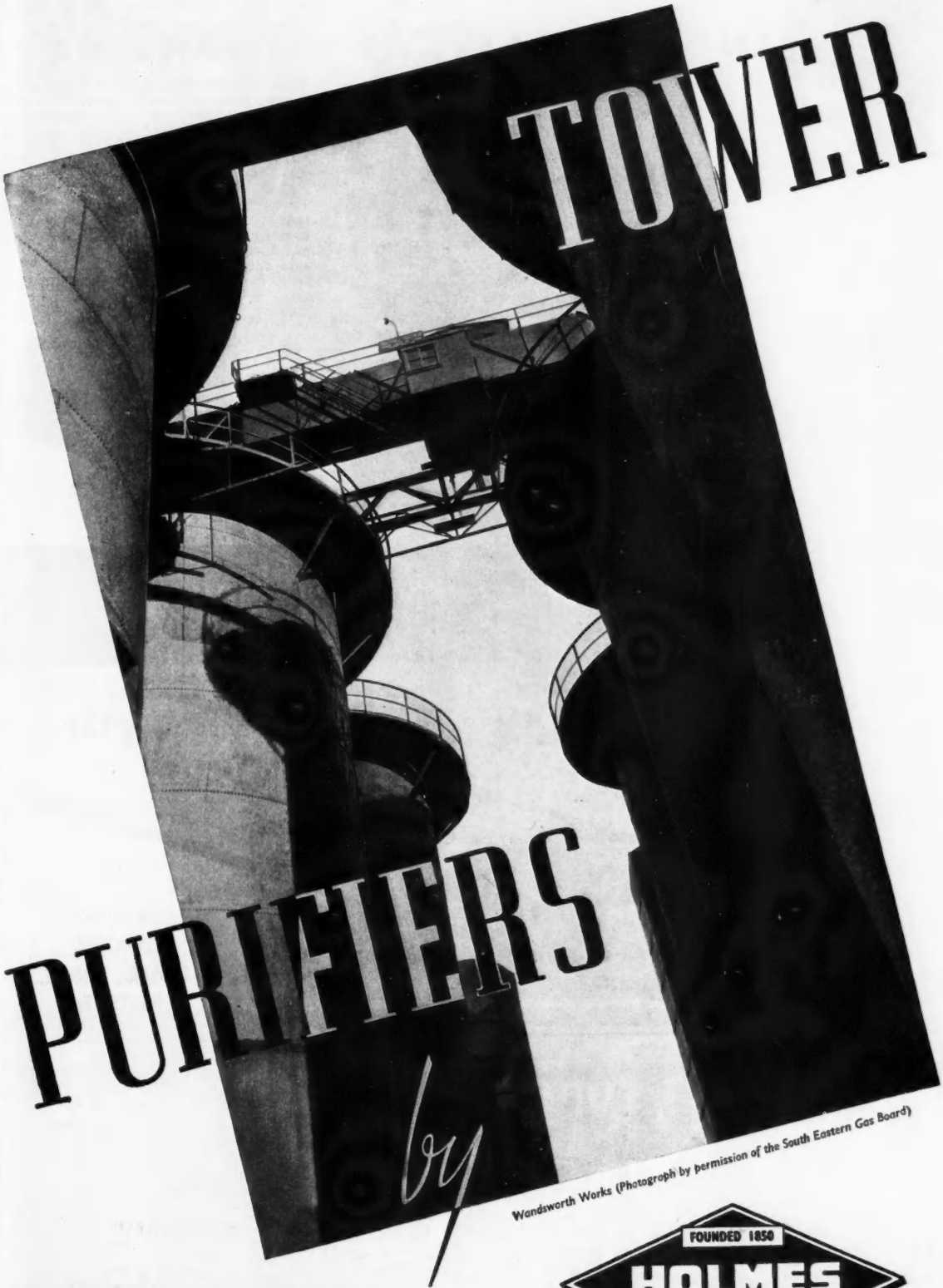


Wandsworth Works (Photograph by permission of the South Eastern Gas Board)

REPEAT Orders have been completed for both Wandsworth and Birmingham, and now ten similar installations are in hand for nine undertakings.

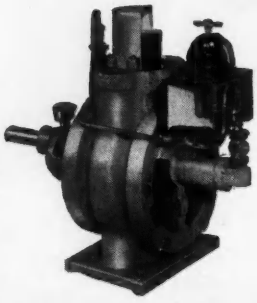
FOUNDED 1850
HOLMES
HUDDERSFIELD
• LONDON • BIRMINGHAM

C 265

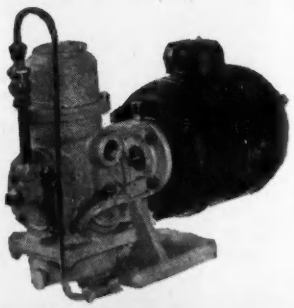
Tornado

INDUSTRIAL GAS COMPRESSORS

FOR COMPRESSING AIR OR GAS SUPPLIED USED FOR FURNACE HEATING, METAL MELTING, BRAZING, SOLDERING BITS, LAUNDRY IRONS ETC.



TYPE 4 COMPRESSORS (see sectionalised illustration left) are fitted with automatic, internal, by-pass valves and lubricators. The complete unit includes motor and drive on a common bedplate, all of Keith Blackman manufacture.
CAPACITY RANGE: 500 to 20,000 cub. ft. of gas or air per hour at 3-5 lbs. per sq. inch pressure.
AREA OCCUPIED: from 9¼" x 16½" to 61" x 27".



DIRECT COUPLED COMPRESSORS (see illustration right) are fitted with automatic, internal, by-pass valves and lubrication systems. They are direct coupled to Keith Blackman motors. Type OA compressors in this range occupy a floor space of only 18" x 7½".
CAPACITY RANGE: 100 to 750 cub. ft. of gas or air per hour at 3 lbs. per sq. inch pressure.

INJECTORS BURNER NOZZLES BLOWPIPES RADIANT DISC BURNERS LAUNDRY AND TAILOR IRONS SOLDERING IRONS SOLDERING STOVES SMALL FURNACES

"TORNADO" AIR AND GAS MIXTURE CONTROLLERS SAFETY CUT-OFF SWITCH (ALSO USED AS METER PROTECTION VALVE AND

INDUSTRIAL GAS AIR FLOW SWITCH) SAFETY SHUT-OFF VALVES NON-RETURN OR BACK PRESSURE VALVES METER PROTECTION VALVES (BY-PASS TYPE)

EQUIPMENT RELAY THERMOSTATS THERMOSTAT CONTROLLERS DIRECT ACTING THERMOSTATS SERVICE GOVERNORS AIR FLOW SWITCHES COMPRESSORS GAS FIRED UNIT HEATERS GAS BOOSTERS AIR BLOWERS

Keith Blackman LIMITED

MILL MEAD ROAD TOTTENHAM LONDON N.17

'Phone Tottenham 4522 (twelve lines) 'Grams "Keithblac, Norphone, London."

432/1/GJ

COAL AND COKE SCREENING & SIZING PLANTS.

RETORT SETTINGS PRODUCERS, FURNACES REPAIRS.

GOODALL, CLAYTON & Co. LTD. — LEEDS.

CONVEYORS, ELEVATORS, BUNKERS, ROOFS, HOISTS, Etc.

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HARRIS & PEARSON LTD

STOURBRIDGE, ENGLAND

INSULATING BRICKS, RECUPERATOR TUBES, SPECIAL SEMI-SILICA QUALITY FOR SEGMENTAL RETORTS WITH NO EXPANSION OR CONTRACTION AT 1400° C

Manufacturers of

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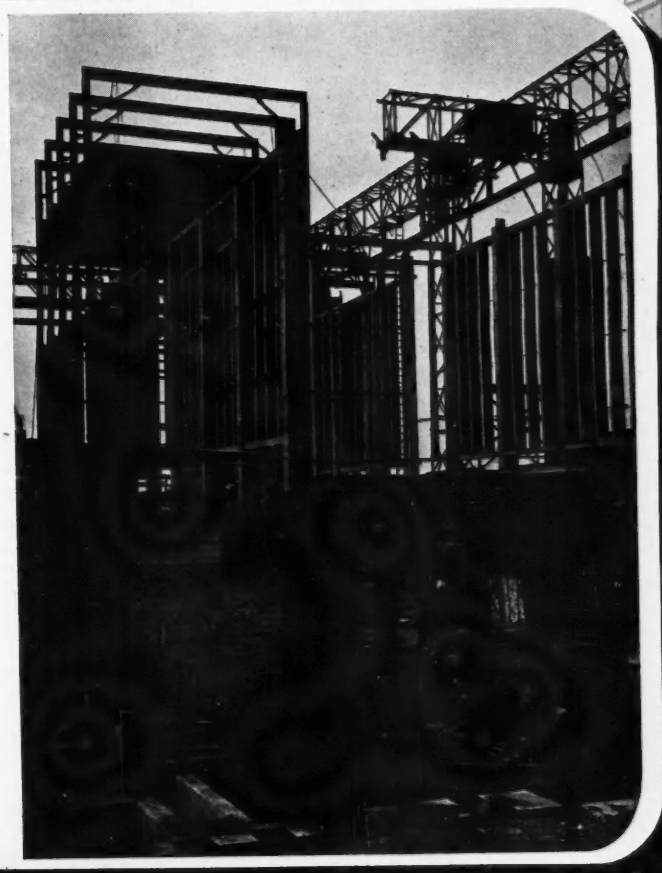

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